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RECORD, CASE No. 13,922.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1892.

TERM NO., ~~289.~~ 58

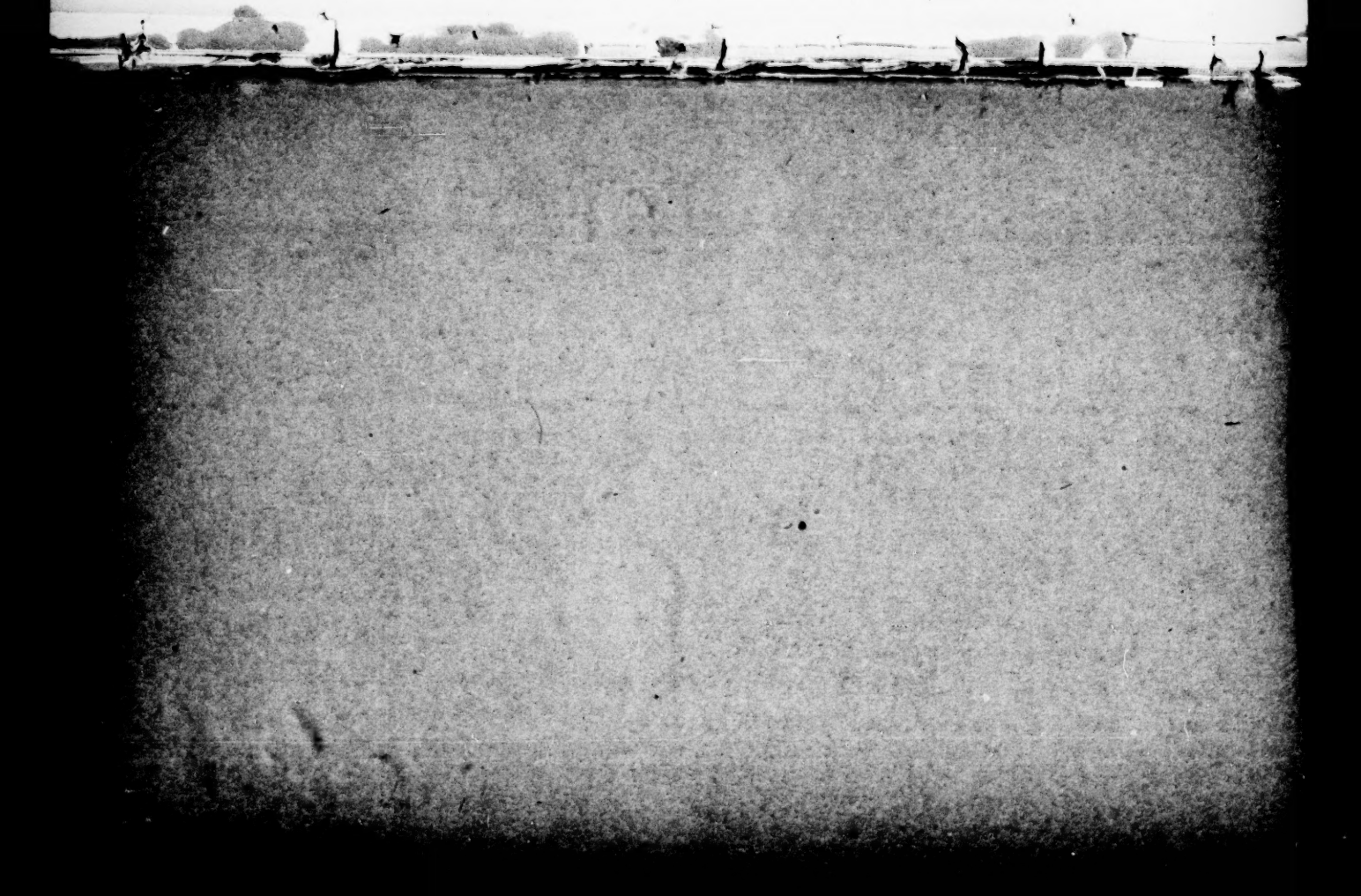
THE BALL AND SOCKET FASTENER COMPANY OF NASHUA, N. H., APPELLANT,

vs.

EDWIN J. KRAETZER.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

FILED NOVEMBER 18, 1889.



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1 UNITED STATES OF AMERICA, *Massachusetts District*, } *ss:*

At a circuit court of the United States for the first circuit, begun and holden at Boston, within and for the district of Massachusetts, on Wednesday, the fifteenth day of May, in the year of our Lord one thousand eight hundred and eighty-nine, before the Honorable Thomas L. Nelson, district judge.

BALL AND SOCKET FASTENER COMPANY, Complainant, *v.* EDWIN J. KRAETZER, Defendant. } No. 2362. Equity.

The bill of complaint in this cause was filed in the clerk's office on the twenty-seventh day of January, A. D. 1887, and was duly entered at the October term of this court, A. D. 1886, and is in the words and figures following:

2 *Bill of Complaint.* (*Filed Jan.* 27, 1887.)

To the honorable the judges of the circuit court of the United States, sitting in equity, within and for the district of Massachusetts:

The Ball and Socket Fastener Company of Nashua, N. H., a corporation duly organized under the laws of the State of New Hampshire, and having a usual place of business in Boston, in the county of Suffolk, in the State and district of Massachusetts, brings this its bill against Edwin J. Kraetzer, of said Boston, a citizen of said State of Massachusetts; and thereupon your orator complains and says:

1. That heretofore, and before the twenty-seventh day of June, A. D. 1882, William S. Richardson, of Newton, in said State of Massachusetts, became and was the original and first inventor of an improvement in fastening for gloves and other articles, and thereupon made application for letters patent of the United States therefor; and, after due proceedings had, letters patent in due form of law, numbered 260,050, dated June 27, 1882, were duly issued to said William S. Richardson, assignor to Clarence John Blake, trustee, for said invention, according to a description and claims pre-

2*a* pared by said Richardson and annexed to the said letters patent; and your orator makes profert of the said original letters patent.

2. And that said letters patent were duly vested in your orator by assignments duly recorded.

3. And that heretofore, and before the seventeenth day of June, A. D. 1884, said William S. Richardson became and was the original and first inventor of an improvement in fastenings for gloves and other articles, and thereupon made application for letters patent therefor; and, after due proceedings had, letters patent in due form of law were duly issued to said William S. Richardson, assignor to

your orator. for said invention, numbered 300,508, dated June 17, 1884, according to a description and claims prepared by said Richardson and annexed to said letters patent; and your orator makes profert of said original letters patent.

4. And that heretofore, and before the seventeenth day of June, A. D. 1884, the said William S. Richardson became and was the original and first inventor of an improvement in fastenings for gloves and other articles, and thereupon made application for letters patent therefor; and, after due proceedings had, letters patent in due form of law were duly issued to said William S. Richardson, assignor to your orator, for said invention, numbered 300,509, dated June 17, 1884, according to a description and claims prepared by the said William S. Richardson and annexed to the said letters patent; and your orator makes profert of said original letters patent.

5. And that heretofore, and before the seventeenth day of June, A. D. 1884, said William S. Richardson became and was the original and first inventor of an improvement in the manufacture of fastenings for gloves and other articles, and thereupon made application for letters patent therefor; and, after due proceeding- had, letters patent in due form of law were duly issued to said William S. Richardson, assignor to your orator, for said invention, numbered 300,510, dated June 17, 1884, according to a description and claims prepared by said Richardson and annexed to the said letters patent; and your orator makes profert of the said original letters patent.

3 6. And that heretofore, and before the eighth day of September, A. D. 1885, Albert Gallatin Mead, of said Boston, became and was the original and first inventor of an improvement in buttons, and thereupon made application for letters patent therefor; and, after due proceedings had, letters patent in due form of law were duly issued to said Mead, assignor to your orator, for the said invention, numbered 325,688, dated Sept. 8, 1885, according to a description and claims prepared by the said Mead and annexed to said original letters patent; and your orator makes profert of the said original letters patent.

7. And that heretofore, and before the eighth day of September, A. D. 1885, said William S. Richardson became and was the original and first inventor of an improvement in fastenings for gloves and other articles, and thereupon made application for letters patent therefor; and, after due proceedings had, letters patent in due form of law were duly issued to said William S. Richardson for said invention, numbered 325,699, dated Sept. 8, 1885, according to a description and claims prepared by the said Richardson and annexed to the said letters patent; and your orator makes profert of the said original letters patent.

8. And thereafter said letters patent were duly vested in your orator by assignment.

9. And your orator further says on information and belief that said several inventions in said several letters patent are capable of being embodied in one and the same fastening, and that they are so embodied in the fastenings heretofore made and sold by complainant and in other fastenings hereinafter mentioned as having been

made, used, and sold by said defendant in violation and infringement of said several letters patent.

10. That the inventions disclosed in said several letters patent are of great value and have been extensively used and put in practice and your orator and its assignors have been exclusively possessed of the same, and that no person, without its or their consent or license, ought to make, use, or vend fastenings embodying the said inventions as disclosed in said several letters patent.

11. And now so it is, may it please your honors, that the defendant, Edwin J. Kraetzer, wholly disregarding your orator's
4 rights in the premises, and without right and without license of your orator or of your orator's assignors, has made, used, and sold to others to be used great quantities of fastenings embodying the said inventions of the said William S. Richardson and the said Albert Gallatin Mead, and threatens and intends to continue to make, sell, and use the same, to the great damage and injury of your orator in the premises, whereby the said defendant has infringed and leads your orator to believe that he will continue to infringe said letters patent of your orator, to the great wrong, injury, and damage of your orator.

Wherefore, that the defendant may be enjoined from further continuance of said infringement, and that he may be ordered to account with and to your orator for the fastenings made, used, and sold to others to be used by him, and to pay to your orator the profits derived by him from the said unlawful manufacture, use, and sale, and also damages caused by the said infringement;

And that further and other relief may be granted to your orator as to your honors shall seem meet and the nature of this case may require, may it please your honors to grant unto your orator:

First. A writ of injunction during the pendency of this suit;

Second. A writ of injunction during the life of the said patents;

Third. A writ of subpœna,

Each in due and usual form and each to be directed to the defendant, Edwin J. Kraetzer.

And your orator will ever pray, etc.

THE BALL AND SOCKET
FASTENER COMPANY,
By W. S. RICHARDSON, *Treasurer.*

THOS. WM. CLARKE,
Solicitor and of Counsel.

UNITED STATES OF AMERICA.

STATE AND DISTRICT OF MASSACHUSETTS, } ss:
County of Suffolk, }

On the twenty-fifth day of January, 1887, before me came William S. Richardson, treasurer of The Ball and Socket Fastener
5 Company, the complainant named in the foregoing bill, and he, being before me duly sworn, did depose and say that

he is treasurer of said The Ball and Socket Fastener Company; that he has read the foregoing bill; that the same is true excepting the matters therein stated on information and belief, and as to those he believes it to be true.

[SEAL.] F. F. RAYMOND, 2D,
Notary Public.

At the said October term, A. D. 1886, the following plea was filed:

Plea. (*Filed April* 13, 1887.)

To the honorable the judges of the circuit court of the United States in and for the district of Massachusetts:

The plea of Edwin J. Kraetzer, defendant, to the bill of complaint of The Ball and Socket Fastener Company, complainant.

This defendant, by protestation, not confessing all or any of the matters and things in the complainant's bill of complaint contained to be true in such manner and form as the same *is* therein set forth and alleged, for plea to said bill of complaint, says—

That its said bill of complaint is multifarious, in that he is charged in and by the said bill of complaint with infringing the following letters patent, to wit:

United States letters patent granted to—

First, William S. Richardson June 27, A. D. 1882, No. 260,050;
Second, William S. Richardson June 17, A. D. 1884, No. 300,508;
Third, William S. Richardson June 17, A. D. 1884, No. 300,509;
Fourth, William S. Richardson June 17, A. D. 1884, No. 300,510;
Fifth, Albert Gallatin Mead September 5, A. D. 1885, No, 325,688;
Sixth, William S. Richardson Sept. 8, A. D. 1885, No. 325,699,

which, it is alleged, are capable of being embodied in one and the same fastening, and are in fact so used by him; whereas it
6 appears from an examination and comparison of the said patents, copies of which are annexed hereto and make a part of this plea, that said patents are for six separate and distinct improvements, which are incapable of being embodied in one and the same fastening or device.

Wherefore this defendant says that he is advised that this court, sitting as a court of equity, will not compel this defendant to unite six separate and distinct defences, each depending upon distinct and different proofs, so as to prejudice the defence and draw this defendant into needless and oppressive expense, and prays the judgment of the honorable court whether it shall be compelled to make any other or further answer to said bill of complaint, and prays to be hence dismissed with its reasonable costs and charges in this behalf most wrongfully sustained.

EDWIN J. KRAETZER.

I do hereby certify that in my opinion the foregoing plea is well founded in point of law and should prevail, and is not interposed for the purpose of delay.

WM. B. H. DOWSE.

BOSTON, *April* 4, 1887.

COMMONWEALTH OF MASSACHUSETTS, } ss:
County of Suffolk, }

Edwin J. Kraetzer, being duly sworn, deposes and says that he is the defendant in the above-entitled suit; that he has read or heard read the foregoing plea by him subscribed; that he believes the same to be true, and that said plea is not interposed for the purpose of delay.

EDWIN J. KRAETZER.

Subscribed and sworn to this sixth day of April, A. D. 1887, before me—

[SEAL.] CHARLES L. FITCH,
Notary Public.

At the said October term the following replication was filed:

7 *Replication.* (*Filed May* 3, 1887.)

Complainant joins issue on the plea.

By solicitor, THOS. WM. CLARKE.

This cause was thence continued from term to term to the October term, A. D. 1887, when the following notice of discontinuance was filed and the following order of court thereon was entered:

Notice of Discontinuance. (*Filed Feb.* 14, 1888.)

Please take notice that on Tuesday, Feb. 14, 1888, at 2 p. m., or as soon thereafter as counsel can be heard, I shall move to amend the bill therein by discontinuing the bill on letters patent to William S. Richardson, dated June 27, 1882, No. 260,050, and dated Sept. 8, 1885, No. 325,698 or 325,699.

THOS. WM. CLARKE.

To W. B. H. Dowse, Esq.

Order of Court.

COLT, *J.*:

Motion granted, the complainant to pay costs to which the defendant has been put by reason of including the above-named patents in his bill; such costs to include all the costs of taking evidence to date.

By the court:

JOHN G. STETSON, *Clerk.*

At the said October term the following answer was filed:

Answer. (*Filed April* 20, 1888.)

To the honorable the judges of the circuit court of the United States, sitting in equity, in and for the district of Massachusetts:

The answer of Edwin J. Kraetzer, defendant, to the bill of complaint of The Ball and Socket Fastener Company, complainant.

The said defendant, by protestation, not confessing all or any of the matter- and things in the complainant's bill of complaint
7*a* contained to be true in such manner and form as the same *is* therein set forth and alleged, and reserving to himself all right of exception as to the matters contained in said bill, for answer thereto, or to so much thereof as he is advised is material to be answered thereunto, says:

I. He suggests and charges that said bill of complaint is multifarious, in that he is charged in and by said bill of complaint with infringing the following letters patent, to wit, United States letters patent granted to—

First, William S. Richardson, dated June 17, 1884, No. 300,508;
Second, William S. Richardson, dated June 17, 1884, No. 300,509;
Third, William S. Richardson, dated June 17, 1884, No. 300,510;
Fourth, Albert G. Mead, dated Sept. 8, 1885, No. 325,688, which, it is alleged in said bill of complaint, are capable of being embodied in one and the same fastener, and are in fact so embodied in one and the same fastener made, sold, and used by this defendant; whereas he charges that it appears from an examination and comparison of the said patents, copies of which are annexed hereto and made a part of this answer, that the said patents are for four separate and distinct improvements, which he denies are capable of being embodied in one and the same fastening or device and are embodied in one and the same fastening or device made, sold, or used by him.

Wherefore this defendant submits that this complainant, before compelling this defendant to unite four separate and distinct defences, each depending upon distinct and different proofs, so as to prejudice the defence and draw this defendant into needless expense, should amend its bill of complaint by cancelling therefrom three of said letters patent and all allegations thereto pertaining; and he further submits that this complainant is not entitled to an injunction, account, or damages or other relief, as now prayed for in its said bill, and prays to be dismissed with his costs.

II. He has no knowledge that the said Ball and Socket Fastener Company is a corporation duly organized under the laws of
7*b* the State of New Hampshire, and that it has a usual place of business in Boston, in said district, as alleged in said bill of complaint, and leaves the complainant to make such proof thereof as it may be advised.

III. He denies that on or before the seventeenth day of June, A. D. 1884, William S. Richardson, of Newton, in the State of Mas-

sachusetts, became and was the original and first inventor of any improvement for fastenings for gloves and other articles not known or used by others before his alleged invention and discovery thereof and not in public use for more than two years prior to his application for a patent therefor.

IV. He is informed and believes that letters patent of the United States were issued to the said Richardson, dated June 17, 1884, No. 300,508, for certain alleged improvements in fastenings for gloves and other articles, but he denies that the said Richardson was the true, original, and first inventor of the said alleged improvement in fastenings for gloves and other articles therein described and claimed; and, further answering, he denies that the said Richardson made proper application for said letters patent, and denies that said letters patent were in due form or properly and lawfully granted to the said Richardson.

V. He is informed and believes that letters patent of the United States were issued to the said Richardson, dated June 17, 1884, No. 300,509, for certain alleged improvements in fastenings for gloves and other articles, but denies that the said Richardson was the true, original, and first inventor of the said alleged improvement in fastenings for gloves and other articles therein described and claimed; and, further answering, he denies that the said Richardson made proper application for said letters patent, and denies that said letters patent were in due form or properly and lawfully granted to the said Richardson.

VI. He is informed and believes that letters patent of the United States were issued to the said Richardson, dated June 17, 1884, No. 300,510, for certain alleged improvements in fastenings for gloves and other articles, but denies that the said Richardson was the true, original, and first inventor of the said alleged improvement in fastenings for gloves and other articles therein described and
7c claimed; and, further answering, he denies that the said Richardson made proper application for said letters patent, and denies that said letters patent were in due form or properly and lawfully granted to the said Richardson.

VII. He denies that on or before the eighth day of September, 1885, Albert G. Mead, of said Boston, became and was the original and first inventor of an improvement in buttons not known or used by others before his alleged invention and discovery thereof and not in public use for more than two years prior to his application for a patent therefor.

VIII. He is informed and believes that letters patent were issued to Albert G. Mead, dated the eighth day of September, 1885, No. 325,688, for certain alleged improvements in buttons, but denies that the said Mead was the true, original, and first inventor of the said alleged improvement in buttons therein described and claimed; and, further answering, he denies that the said Mead made proper application for said letters patent, and denies that said letters patent were in due form or properly and lawfully granted to the said Mead.

IX. He has no knowledge that any of said letters patent mentioned in said bill of complaint are duly vested in this complainant

by assignments duly executed and recorded, and leaves the said complainant to make such proof thereof as it shall be advised.

X. He denies that the said alleged inventions disclosed in said letters patent No. 300,508, No. 300,509, No. 300,510, and No. 325,688, or either of them, are of great value and have been extensively used and put in practice, or that the complainant is the assignor and has been exclusively possessed of the same, and that no person, without the complainant's or its assignor's consent or license, ought to make, use, or vend fastenings embodying the inventions as disclosed in said letters patent No. 300,508, No. 300,509, No. 300,510, and No. 325,688.

XI. He admits that he has manufactured, made, and used glove-fasteners, but denies that he has made, used, or sold to others to use fastenings of any kind containing the said alleged inventions of the said Richardson or the alleged invention of the said Mead, or that he has threatened or still threatens to continue to make, sell, and use the same, to the great damage and injury of this com-
7d plainant; and, further answering, he avers that the glove-fastenings which he admits to have made, sold, and used were made in accordance with and substantially like the invention shown and described in United States letters patent No. 359,615, dated March 22, 1887, granted to this defendant for improvements in glove-fastenings, which said letters patent are the exclusive property of this defendant.

XII. He denies that he has ever in any manner or way whatsoever infringed any valid, legal, or equitable rights or claims to which the complainant was or is legally entitled under said letters patent dated the seventeenth day of June, 1884, or under said letters patent dated the eighth day of September, 1885; and he further denies that he has in any manner or way whatsoever infringed any of said letters patent dated the seventeenth day of June, 1884, and numbered respectively 300,508, 300,509, 300,510, or said letters patent dated the eighth day of September, 1885, No. 325,688, or that he has ever manufactured, sold, or used fasteners such as are described or such as are substantially the same as those described in any of said letters patent dated the seventeenth day of June, 1884, No. 300,508, No. 300,509, No. 300,510, or in said letters patent dated the eighth day of September, 1885, No. 325,688, or that he has threatened so to do.

XIII. He denies that he has derived and received from the manufacture, use, and sale of any fastenings which infringe said letters patent No. 300,508, No. 300,509, No. 300,510, and No. 325,688 any profits or accounts whatsoever.

XIV. He is informed and believes that the said letters patent No. 300,508, No. 300,509, No. 300,510, bearing date the seventeenth day of June, 1884, and said letters patent No. 325,688, bearing date the eighth day of September, 1885, are each and all void, for that the alleged invention therein described and claimed in each of said letters patent and every substantial and material part thereof claimed therein in each of said letters patent as new were prior to the date of said letters patent No. 300,508, No. 300,509, No. 300,510, and No. 325,688 or the date of the application therefor or before the date of

each of the alleged inventions thereof fully and clearly set forth and described in the following letters patent:

8 United States letters patent granted to—

W. W. Chapman May 3, 1859, No. 23821.
R. Boeklen and W. Stachlen Aug. 31, 1861, No. 33025.
J. Barclay Oct. 22, 1867, No. 69959.
Andrew A. Abbot July 14, 1868, No. 79800.
Case and Barclay Oct. 22, 1867, No. 69965.
L. C. Curran May 2, 1876, No. 176,932.
Ira J. Saunders July 16, 1872, No. 129,255.
William A. Johnson, Frank B. Johnson, and H. Smith Worth Oct. 7, 1873, No. 143,512.
S. M. Porter Aug. 2, 1870, No. 105,978.
Harvey T. Lee Oct. 18, 1870, No. 108,491.
Clark M. Platt Sept. 5, 1876, No. 181,979.
William S. Richardson Nov. 13, 1877, No. 197,176.
William S. Richardson June 27, 1882, No. 260,050.
William S. Richardson May 1, 1883, No. 276,714.
William S. Richardson Feb. 7, 1882, No. 253,228.
William S. Richardson Dec. 30, 1884, No. 309,877.
William S. Richardson Sept. 8, 1885, No. 325,698.
I. J. Saunders Aug. 7, 1883, No. 282,571.
A. G. Mead May 11, 1880, No. 227,440.
Comstock and Nicholson June 7, 1870, No. 103,985.
Otto Sliker Nov. 29, 1870, No. 109,771.
Clark M. Platt Aug. 29, 1871, No. 118,640.
A. G. Mead June 6, 1876, No. 178,316.
John Meaker Oct. 31, 1882, No. 266,710.
E. J. Kraetzer July 17, 1883, No. 281,376.
E. J. Kraetzer Dec. 11, 1883, No. 290,067.
E. J. Kraetzer Sept. 30, 1884, No. 306,021.
Whitby May 17, 1881, No. 241,767.
Krementz May 6, 1884, No. 298,303.
Loewenthal July 19, 1881, No. 244,632.
Goulding Jan. 17, 1882, No. 252,311.
Wood Feb. 7, 1865, No. 46288.
Church May 4, 1880, No. 227,094.
Kitson Aug. 13, 1878, No. 206,883.

Kitson Aug. 13, 1878, No. 296,883.

8a Sorg May 13, 1879, No. 215,406.

Bates Jan. 18, 1881, No. 236,663.
Bray April 12, 1881, No. 239,926.
McGill Oct. 28, 1879, No. 220,935.
Essex Dec. 7, 1880, No. 235,144.
Walker Feb. 26, 1878, No. 200,633.
Ford Nov. 1, 1881, No. 249,032.
Pringle July 4, 1882, No. 260,411.
Halsey April 7, 1874, No. 149,473.
Williams Nov. 24, 1885, No. 331,266.
Downs Aug. 26, 1879, No. 218,864.
C. H. Mumford Aug. 17, 1880, No. 231,234.

S. W. Shorey May 3, 1881, No. 241,076.
S. W. Shorey Aug. 14, 1883, No. 283,032.
Ernst Wuerfel Jan. 29, 1884, No. 292,729.
C. A. Wood May 7, 1878, No. 203,308.
C. E. Bates Sept. 3, 1878, No. 207,706.
E. Wright Oct. 5, 1880, No. 233,060.
B. L. D'Anbigne April 20, 1880, No. 226,722.
E. S. and J. E. Wheeler June 11, 1878, No. 204,866.
H. Burtey Feb. 26, 1878, No. 200,691.
E. Dobell June 29, 1880, No. 229,240.
L. Hill Dec. 9, 1879, No. 222,400.
W. P. Dolloff July 20, 1880, No. 230,115.
L. Hill March 9, 1880, No. 225,375.
F. I. Palmer March 27, 1886, No. 53471.
F. I. Palmer March 27, 1886, No. 53472.
C. H. Brown June 13, 1876, No. 178,726.
Robert R. Ruggles Aug. 8, 1865, No. 49305.
W. P. Dolloff Nov. 19, 1878, No. 210,017.
Ernst Schnopp June 30, 1876, No. 180,938.
Francis E. Drake June 14, 1864, No. 43152.
C. E. Bates Nov. 9, 1877, No. 197,959.
C. N. Nickerson Oct. 27, 1868, No. 83403.
G. J. Capewell July 16, 1872, No. 128,949.
E. S. Wheeler Oct. 3, 1876, No. 183,996.
G. J. Capewell Feb. 23, 1869, No. 3307, reissue.
8*b* C. McIntire Dec. 28, 1858, No. 22442.
G. A. Meacham April 8, 1862, No. 34897.
W. Vogt June 17, 1862, No. 35641.
C. Robitaille April 17, 1866, No. 54071.
P. F. Mauvas Dec. 4, 1866, No. 60217.
Somers and Atwood May 4, 1869, No. 3421, reissue.
J. G. Kenyon June 8, 1869, No. 90948.
H. S. Wing Feb. 13, 1877, No. 187,442.
G. W. Phillips Aug. 1, 1871, No. 117,564.
C. A. Newton Aug. 8, 1871, No. 117,916.
S. S. Ritter May 9, 1865, No. 47661.
L. C. Chase June 15, 1869, No. 91308.
I. Cole March 30, 1869, No. 88451.
F. Hayden July 10, 1840, No. 1682.
A. E. Newcomb Sept. 29, 1874, No. 155,383.
E. Bredt Nov. 10, 1871, No. 121,231.
W. Orr June 13, 1876, No. 178,552.
David Rait April 6, 1852, No. 8860.
English letters patent granted to—
Edwin Green, No. 1554 of the year 1856.
G. A. Huddart, No. 2753 of the year 1865.
G. A. Huddart, No. 1898 of the year 1864.
Maurice Vogl, No. 2590 of the year 1862.
Schloss, No. 1450 of the year 1870.
Francis Hogg, No. 2087 of the year 1873.
Charles Bayer, No. 809 of the year 1877.

Joseph Whitby, No. 1719 of the year 1880.
Frederick Dowler, No. 795 of the year 1883.
William E. Newton, No. 395 of the year 1868.
French letters patent granted to—
Delpy, No. 116,212 of the year 1876.
Schloss, No. 95127 of the year 1872.
No. 110,157 of the year 1875.
No. 64882 of the year 1864.
German letters patent granted to—
Walden, No. 22171.
No. 578.
8c Walden, No. 4257.
No. 6682.
No. 14926.
No. 16545.

XV. He is informed and believes that the things or combinations, or substantially the same things or combinations, described and claimed in each of said letters patent No. 300,508, No. 300,509, No. 300,510, all bearing date the seventeenth day of June, 1884, and in letters patent No. 325,688, bearing date the eighth day of September, 1885, were, prior to the date of each of the said alleged inventions or any of them, invented, known to, and used by the following-named parties at the following-named places:

Edwin J. Kraetzer, of Boston, in said district, and at said Boston.
Albert G. Mead, of Boston, in said district, and at said Boston.
Stephen Porter, of Boston, in said district, and at said Boston, and many other persons whose names and residences will be hereafter given on sufficient notice to this defendant.

XVI. He denies on information and belief that the said alleged inventions described and claimed in each of said letters patent No. 300,508, No. 300,509, No. 300,510, and No. 325,688, at and prior to the date of each of the said alleged inventions thereof, were new or useful and avers that in the state of the art as known and practised prior to the date of each of the said alleged invention or inventions there was any patentability or novelty in making, constructing, or using the things or combinations described and claimed in said letters patent or any of them, as the references to the state of the art mentioned in this answer show that the said Richardson and the said Mead, taking old and well-known things and devices which were not invented by them or either of them, appropriated them, without change of device, operation, use, or effect, and employed them in the usual and customary manner in which they had been before employed. He further charges that said aggregation of such old devices is not invention within the meaning of the patent law and is not patentable.

XVII. He further avers that if there is any improvement in the form of fastener shown, described, and claimed in any of the
8d said letters patent mentioned in said bill of complaint over fasteners shown to have been in existence by the state of the art in this answer prior to the date of each of the alleged inventions shown in said letters patent mentioned in said bill of complaint,

such improvement was merely the work of a skilled mechanic and was not an invention within the meaning of the patent law and is not patentable.

XVIII. He further avers on information and belief that each of the said alleged inventions shown, described, and claimed in said letters patent No. 300,508, No. 300,509, No. 300,510 was in public use more than two years before the said Richardson made application for letters patent thereon.

He further avers on information and belief that the said alleged invention shown, described, and claimed in said letters patent No. 325,688 was in public use for more than two years before the said Mead made application for a patent thereon.

XIX. And this defendant, further answering, denies any and all unlawful acts wherewith it is by said bill of complaint charged and submits that the complainant is not entitled to an injunction, account or damages, or other relief prayed for in its said bill, and, without admitting any of the matters charged and not herein sufficiently answered hereunto as true, prays to be hence dismissed, with his costs.

EDWIN J. KRAETZER.

W. B. H. DOWSE,
Solicitor and of Counsel for Defendant.

UNITED STATES OF AMERICA, *District of Massachusetts,* } ss:

Edwin J. Kraetzer, defendant in the foregoing answer named being duly sworn, deposes and says that so far as the statements contained therein are of his own knowledge they are true, and so far as they are acquired from the information of others he verily believes them to be true.

E. J. KRAETZER.

Subscribed and sworn to this eighteenth day of April, A. D. 1888, before me—

[SEAL.] ALBERT E. LEACH,
Notary Public.

9 This cause was thence continued to the May term, A. D. 1888, when, on the twelfth day of September, it was stipulated as follows:

Stipulation. (*Filed Sept.* 12, 1888.)

It is stipulated by and between counsel for the respective parties that the evidence already taken for the complainant shall stand as the complainant's *prima facie* case, and that the evidence already taken by the defendant shall stand as a part of the defendant's evidence on the answer.

This cause was thence continued from term to term to this present May term, A. D. 1889, when, publication of the testimony hav-

ing passed in the clerk's office, the same is set down for hearing and fully heard by the court, the Honorable Le Baron B. Colt, circuit judge, sitting and holding the court.

On the eighteenth day of September, A. D. 1889, the opinion of the court is announced and the following decree is entered:

Final Decree, Sept. 18, 1889.

This cause comes on to be heard at this present May term, A. D. 1889, of this court, upon the pleadings and proofs, and is argued by counsel for the respective parties; and now, upon consideration thereof, it is ordered, adjudged, and decreed that the bill of complaint in this cause be, and the same is hereby, dismissed with costs for the defendant, taxed at three hundred dollars ($300).

By the court:

JOHN G. STETSON, *Clerk.*

From this decree the complainant in open court claims an appeal to the Supreme Court of the United States and gives good and sufficient security that it will prosecute its appeal to effect and answer all damages and costs if it fail to make its plea good, and said appeal is allowed.

A true record.

Attest: JOHN G. STETSON, *Clerk.*

10 The following is the evidence used at the hearing of said cause before said circuit court:

Evidence for Complainant,

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, Stephen Thacher, special examiner.

Present: Thomas W. Clarke, Esq., of counsel for complainant; William B. H. Dowse, Esq., of counsel for defendant.

Deposition of Charles F. Brown.

Direct examination by THOMAS W. CLARKE, Esq., of counsel for complainant.

BOSTON, *July* 11, 1887.

Int. 1. Please state your name, age, residence, and occupation.

Ans. Charles F. Brown; age, thirty-eight; residence, Reading, Mass.; occupation, solicitor of patents and, as an incidental branch of said occupation, expert in patent causes. I have been engaged continuously as solicitor of patents for the last twelve or fourteen years, and prior to that period was engaged as mechanical draughtsman. Within the past five years I have testified as a mechanical expert in several patent cases; have had occasion to examine a large number of inventions, prepare applications for patents, and to com-

pare inventions and to give opinions as to points of resemblance and difference.

(Adjourned.)

10*a* BOSTON, *July* 29, 1887.

(Complainant's counsel offers in evidence letters patent No. 260,050, granted June 27, 1882, to William S. Richardson, assignor to Clarence John Blake, trustee; No. 300,508, No. 300,509, and No. 300,510, granted June 17, 1884, to William S. Richardson, assignor to the complainant; No. 325,688, granted Sept. 8, 1885, to Albert Gallatin Mead, and No. 325,699, granted Sept. 8, 1885, to William S. Richardson.)

Int. 2. Have you examined and do you understand letters patent just introduced in evidence; and, if so, will you state whether or not, in your opinion, the thing described in the several claims or either of them of the several patents are capable of embodiment in one and the same fastening, giving your reasons for any opinion you may express?

(Complainant's counsel here offers in evidence in this case the four exhibits already offered in a case of the same title, marked "Kraetzer Fastener Washer," "Kraetzer Fastener Socket," "Kraetzer Fastener Stud Washer," "Kraetzer Fastener Stud," and "Glove with Kraetzer Fastener," and defendant's counsel declines to admit that said fasteners were made and sold by the defendant.)

You may use, to illustrate your answer, the exhibits just produced.

Ans. I have examined and think I understand the letters patent referred to in the question, and specifically the things described in said patents and referred to in their claims.

In my opinion, the devices described in the said letters patent are capable of embodiment in one and the same fastening and are, in fact, so embodied in the Kraetzer fastener.

I will explain my position by taking the Kraetzer fastener first produced as an example to talk about.

The Kraetzer fastener is composed of two parts, one of which has been called a button and the other a button-hole. The button is composed of a tubular rivet and a hat-shaped eyelet or washer formed to receive the post of the rivet; the rivet is passed through the piece of material which is to carry the button, and is inserted in the hat-shaped washer which is placed on the opposite side of the material. The end of the rivet post is then upset or spread to
10*b* interlock it with the hat-shaped washer, the flanges of the rivet and washer being held firmly clasped against the material by the engagement of the rivet and washer thus effected. The enlargement of the end of the rivet post causes it to fill an enlargement previously formed in the hat-shaped washer, and thus make a comparatively rigid button head. The button-hole member is composed of a spring clasp and a holder therefor; the spring

clasp is an annulus, the continuity of which is broken so that it is a resilient ring or clasp, adapted to yield to permit the passage through it of the head of the button member, and to contract around the neck of the button and oppose the withdrawal of the head. The holder of the spring clasp is composed of, first, a bell-shaped casing or eyelet enlarged at one end to form a chamber or recess for the spring clasp; secondly, a cup washer, the margin of which is turned over upon the enlarged end of the casing or eyelet, said washer and the enlarged end of the casing or eyelet constituting flanges which project inwardly at opposite sides of the spring clasp and confine the latter between them; and, thirdly, a dome-shaped washer having a central hole surrounded by an annular recess or depression formed in the crown of the washer. Said hole receives the smaller end of the casing or eyelet, and the latter is upset or turned upwardly into said recess, the flange formed by the upsetting operation being caused by the recess to lie about flush with the exterior of the dome washer.

Prior to the uniting of the dome washer and casing, as last described, the smaller end of the casing is passed through a hole in the piece of material which is to carry the button-hole, so that the larger end of said casing which holds the spring clasp bears against one side of the material (the inner side).

The dome washer is then placed against the opposite or outer side of the material and united to the smaller end of the eyelet or casing as above described, and by this means the material is forced into the dome by the casing and clamped between the dome and casing, that part of the material which is between the dome and casing being considerably stretched. The spring clasp is therefore held in or near the plane of the piece of material which carries it, said clasp occupying the place of that part of the material which is pressed into the dome washer. This location of the spring clasp brings the point of engagement of the button and button-hole close to the plane of the proximate surfaces of the overlapping pieces carrying the button and button-hole, so that the draft or strain is about in line with said pieces, and consequently the button has no such tendency to tip as it would if it were grasped at a point above or out of line with the piece of material carrying the button-hole member.

10c

The Richardson patent, No. 260,050, describes and claims "a fastening for gloves and other articles, consisting of two members, one of which, the button-hole member, is provided with a socket having spring-yielding sides about the circular opening to the socket and adapted to be fastened to the material, and the other of which consists of a ball and tongue also adapted to be fastened to the material, and the ball of which is adapted to enter the socket of the other member of the fastening device and be held therein." The above is quoted from the first claim of the patent.

The socket or button-hole member of this Richardson patent has spring-yielding sides which open to admit the entrance of the head of the button member between them and contract around the neck of the button member to retain said head, and is formed to wholly

cover that portion of the button head which passes between the spring-yielding sides, so that when the button is snapped into the spring button-hole (yielding sides) its advancing end will not be seen on the opposite side of the button-hole and will not come in contact with the wearer's wrist when the socket is placed with its closed side inward, as in the Richardson patent under consideration, the closed side of the socket being interposed between the button head and the wrist and preventing the possible discomfort to the wearer which might result from the impact of the button head against the wrist when the button is being forced into the button-hole.

The button-hole member of the Kraetzer fastener has a socket with spring-yielding sides about the circular opening to the socket and is adapted to be fastened to the material.

It is true that said socket is arranged with its opening at the inner side and its dome or continuous portion outward, so that the button moves outwardly in entering the socket instead of inwardly,
11 as in the Richardson patent now being considered; but this is immaterial, since the socket arranged as in the Kraetzer fastener prevents contact of the button with the thumb or finger which presses the socket onto the button, and thus, as in the said Richardson patent, distributes the pressure required to engage the button with the button-hole, so that no discomfort is caused to the wearer. Moreover, a socket having its opening inward and its continuous portion outward is described and referred to in the claim of another Richardson patent, to which I shall presently refer.

The Kraetzer fastener, then, has the socket with the spring-yielding sides of the Richardson patent, No. 260,050, and has also a button member composed of a ball (the enlarged outer end) and a tongue (the shank or neck) adapted to be fastened to the material, the ball being adapted to enter the socket of the button-hole member and be held therein by the spring-yielding sides, so that the Kraetzer fastener embodies the invention shown in the Richardson patent, No. 260,050, and referred to in the first and second claims thereof.

The Richardson patent, No. 300,508, shows and describes and in its first claim refers to "a socket or cup-shaped member of a glove or other fastening having spring sides, the flanges a^2, and an integral fastening or attaching device."

This is a modification of the spring button-hole, and its novel features are flanges a^2, added to the spring sides to bear against one side of the material, and an integral fastening device, shown in the patent as a tube or eyelet, a, which is inserted in the fabric, and is upset upon the opposite side thereof to clamp or hold the material against the flanges a^2.

Equivalents of this construction are found in the clasp-holding casing or eyelet of the Kraetzer fastener, which has a shoulder formed to bear against the inner side of the dome washer, as the flange a^2 of the Richardson patent bears against one side of the material, and a reduced tubular end or eyelet adapted to be upset upon the opposite side of the dome washer, as the Richardson tube or eyelet a is upset upon the opposite side of the fabric. It is true that the spring sides

of the Kraetzer fastener are not integral with the fastening
12 device, but I do not understand that the attaching device of the Richardson patent must be integral with the spring sides, since I find in the specification of said patent the following:

"In lieu of making the tubular extension or eyelet in one piece with the socket or cup, the same result is obtained if the edge of the socket or cup, which now makes the flange, incloses the flange of a separate tubular rivet or eyelet, and the two parts may be united either before the fastening is secured in place for use or during the act of so securing it."

The Richardson patent, No. 300,509, shows and its first and fifth claims refer to a fastening which differs from that shown in the Richardson patent, No. 260,050, chiefly in that the socket member has its mouth toward the surface of the article to which it is fastened, so that it is adapted to be shut over the ball and cover or partly cover it, the socket having yielding sides. This feature, as before stated by me in this answer, is embodied in the Kraetzer fastener.

The Richardson patent, No. 300,510, shows and describes and in its first claim refers to "a member of a fastener for gloves and other articles, consisting of a section having the flanges a^5, yielding sides a^2, and an eyelet, b^1, having a flange, b^2, and end section, b, turned within the recess formed by the flange a^5."

The device thus claimed is a button-hole member composed of two parts, one of which has the yielding-spring sides which grasp the button, and a flange to bear on one side of the material, bent back under itself to form an annular space or pocket, while the other is an ordinary eyelet, the shank of which is turned outwardly into said annular space or pocket.

The parts of the Kraetzer fastener which are, in my judgment, the equivalents of the parts specified in the Richardson claim above quoted are as follows:

The yielding sides a^2 are the Kraetzer spring clasp; the flange a^5 is the Kraetzer cup-shaped washer, which is applied to one end of the casing which contains the clasp, and is bent or turned at its edge to interlock with said casing, in effect the same as the Richardson flange a^5 is interlocked with the eyelet b, but before the device is applied to the material, instead of during the attaching operation, as in the Richardson device.

The eyelet b^1 is, in the Kraetzer fastener, the casing which
13 contains the clasp, and the flange b^2 thereof is the reduced end of said casing which is turned outwardly to interlock with the dome washer. The Kraetzer dome washer is an extension of the flange b^2, the material being clamped between it (the dome washer) and the part a^5, substantially as in the Richardson fastener it is clamped between flanges a^5 and b^2.

The end section b of the Richardson eyelet is found in the enlarged end of the Kraetzer clasp-holding casing over which the cup washer is turned.

The Kraetzer fastener therefore contains the parts of the Richardson device claimed in patent No. 300,510, and said parts co-operate in substantially the same way in both devices.

In the Richardson patent, No. 325,698, the button-hole member is composed of a socket having yielding sides adapted to grasp the neck of the button and placed against one side of the material, and a dome-shaped cap, which is placed on the opposite side of the material, and is secured to the socket by a capped prong or pointed rivet passed through the cap, the socket and the material interposed between the cap and socket. By this construction the button-hole member is given the appearance of a button on the outer side of the piece of material carrying said member, and the material is centrally fastened, and is stretched in the operation of securing the button member to it, so that the yielding sides of the socket are about in line with the under side of the material carrying it.

The first claim of this patent, No. 325,698, is as follows:

"The fastening device, comprising a capped prong or pointed rivet and the socket D secured to the cap by the prong or pointed rivet, as described," etc.

In the Kraetzer fastening I find in the spring clasp or cut ring and its holder the Richardson socket D, and in the dome washer, to which said eyelet is united, the Richardson dome band, capped prong or rivet C, the annular depression of the Kraetzer dome washer, which is engaged with the eyelet end of the ring-holder, corresponding to the prong of the Richardson capped rivet.

These points of the Kraetzer fastener produce the same result, and in substantially the same way as the parts of the Richardson fastener to which I have compared them, and I am therefore
14 of the opinion that the device which Richardson describes in this patent, No. 325,698, and refers to in the first claim is embodied in the Kraetzer fastening.

The Mead patent, No. 325,688, shows a button member composed of a hollow socket with yielding sides placed against the under side of the piece of material carrying said member and secured thereto by a dome-shaped button head placed against the outer side of the material, the latter being stretched between the socket and button head so that the spring sides of the socket are near the under side of the material.

The fourth claim of this patent is as follows:

"In a fastening device of the nature described, the inclosing portion, composed of a hollow socket centrally secured to the fabric by a button head, F, and with the inclosing portion disposed upon the under side of the flap, substantially as stated."

I find the Mead hollow socket in the clasp and the holder therefor of the Kraetzer fastening and in the Kraetzer dome washer, said parts being relatively arranged and connected in substantially the same way in both devices.

The sixth claim of the Mead patent sets forth:

"A member of a fastening device, consisting of a hollow socket, in combination with a rivet and button head, whereby it is centrally attached to the fabric, substantially as set forth."

This combination is fully embodied in the Kraetzer fastening, the rivet forming an element of said combination being found in the reduced end of the spring holder or casing which is turned outwardly

over the dome washer, exactly as the rivet of the Mead patent is turned outwardly over the button head.

The seventh claim of the Mead patent is as follows:

"A member of a fastening device, composed of a hollow socket, D, centrally attached by an eyelet, *l*, the latter resting upon and within an annular depression, *q*, formed in a concaved collet or disk, E, substantially for purposes herein set forth."

The annular depression of this claim distinguishes it from the preceding claims, and this depression is found in the Kraetzer dome washer and for the same purpose as that for which it is used in the Mead device, viz., a neat finish at the centre of the dome, the end of the eyelet passing through the material from below, being turned outwardly into this depression, and thus caused to lie flush with the outer surface of the dome or cap.

For the reasons stated I find in the Kraetzer fastening the devices referred to in the fourth, sixth, and seventh claims of the Mead patent.

In the Kraetzer fastener, as I have stated, the material carrying the button member is pressed by the spring-clasp holder thereof into the concavity of the dome washer, so that the entire portion clamped between the two portions of the button-hole member is stretched to a considerable extent. This stretching of the material is a very important advantage, because it prevents enlargement of the hole in the material through which the inner part of the button-hole member passes until the adjacent parts of the material—*i. e.*, those parts outside of and surrounding the dome washer—are similarly stretched.

The devices shown in the Mead patent, No. 325,688, and Richardson patent, No. 325,698, stretch the material just as it is stretched by the button-hole member of the Kraetzer fastener, and said patents are the first, so far as I am aware, to show a button-hole member to stretch the material, as I have described, by their application to it.

I have had prepared a series of drawings representing the devices of the several patents to which I have referred, and each of said drawings is accompanied by a sectional view of the button-hole member of the Kraetzer fastener. The principal parts of each device are lettered, and the corresponding parts of the Kraetzer fastener are indicated by the same letters.

(Adjourned.)

BOSTON, *Sept.* 12, 1887.

(Counsel for defendant objects to that part of witness' last answer as refers to Kraetzer's device and patent, No. 325,698, as irrelevant.)

(Witness continues:) I now produce the drawing referred to.

(Same is marked "Brown drawing."

Counsel for defendant objects to so much of the Brown drawing as relates to patent No. 325,698 as irrelevant.)

(Here follows diagram marked p. 15*a*.)

16 Cross-examination by WILLIAM B. H. DOWSE, Esq., of counsel for defendant:

Cross-int. 3. You have said that, in your opinion, the devices described in the said letters patent are capable of embodiment in one and the same fastening. Will you please state what you mean by the term "embodiment" or the word "embody"?

Ans. By the word "embody" I mean reducing to practical shape or construction in a manufactured article in contradistinction to illustrating by drawings.

Cross-int. 4. Will you please apply this statement of yours last made and show what you mean?

Ans. An invention or thing may be illustrated in a drawing. When it is in that condition only I do not consider it embodied, but when the thing represented is actually made in appropriate materials such as its nature and uses require I consider it embodied in the article produced.

Cross-int. 5. When you say that two things are capable of embodiment in one and the same thing what do you mean?

Ans. I mean that two devices are capable of being incorporated in one structure or manufactured article.

Cross-int. 6. Won't you please explain this a little more at length?

Ans. I've given several illustrations of the embodiment of two or more things in one and the same thing in my answer to Int. 2.

Cross-int. 7. When you say that two devices are capable of being incorporated in one structure do you mean that all the parts of each of the devices are brought together in one mass?

Ans. Not necessarily.

Cross-int. 8. What, then, do you mean?

Ans. Of course, I do not mean the bringing together of all the parts of each device, like apples in the pomace of a cider-mill, but in this connection I mean the incorporation of two or more mechanical devices in one manufactured article, making such adaptations of each device to the others with which it is thrown into association by the incorporation as may be suitable.

17 Cross-int. 9. This incorporation, then, is to be accomplished, as I understand you, without the parts losing their individuality?

Ans. That depends upon the meaning you attach to the word "individuality;" if you mean identity of appearance and shape, I should say it would not be feasible in all cases to retain the individuality of the parts.

Cross-int. 10. When you say that the device described in the said Richardson patent, No. 260,050, and that described in Richardson patent No. 300,508 are capable of embodiment in one and the same fastening what do you mean? Please make your answer with reference to these two devices.

Ans. I mean that a fastener can be made having the socket with the spring-yielding sides, as in patent 260,050, and the shoulder or flange, which is used to support the spring-yielding sides and the eyelet, which is capable of being upset at the opposite side of the

material from that on which the shoulder bears, as in patent 300,508. I have already stated in my answer to Int. 2 that these devices are embodied in the Kraetzer fastener.

Cross-int. 11. Will you please state what the device is in patent No. 300,508 which is capable of being embodied with the device in patent No. 260,050 to form one and the same fastening? As I understand your answer, it is the device referred to in the first claim, viz., "a socket or cup-shaped member of a glove or other fastening, having spring sides, the flanges a^2, and an integral fastening or attaching device, all substantially as described." Am I not right?

Ans. I think you are.

Cross-int. 12. Is the device in patent 260,050 which is capable of being embodied in one and the same device with the device shown in said patent No. 300,058 the device described in patent 260,050 as "a member of a fastening device containing a socket, B, having an opening, C, and yielding sides, *d*, adapted to receive a suitable ball or other device, all substantially as and for the purposes described"?

Ans. I so understand it.

Cross-int. 13. Is the device you have referred to in each case one integral piece in each of the two patents last referred to?

18 Ans. The device is shown in each case as made in one piece. In patent No. 300,508 it is stated that in lieu of making a tubular extension or eyelet in one piece with the socket or cup the edge of the socket which now makes the flange may enclose the flange of a separate tubular rivet or eyelet.

Cross-int. 14. Explain how you can embody the eyelet, having the wings or sides a^1 and the flanges a^2 and its integral fastening or attaching device formed all in one piece, shown in said patent No. 300,508, with the device containing the solid socket B, having an opening C and yielding sides *d*, all formed in one piece, to form one and the same fastening.

Ans. I suppose this could be done by forming an eyelet or, perhaps, a series of prongs on the part a^5 on Figs. 1 and 2 of patent 260,050. This supposed eyelet or prongs would be below the socket in the completed device shown in Fig. 9.

(Adjourned.)

SEPT. 13, 1887.

Cross-int. 15. Do you find the ball and tongue spoken of in said Richardson patent, No. 260,050, in the Kraetzer fastener?

Ans. Not in the form shown in that patent.

Cross-int. 16. Do you find a ball and tongue in the Kraetzer fastener?

Ans. I find a button with a head and a neck or shank smaller than the head, which seems to me to be an equivalent of the ball and tongue in patent 260,050.

Cross-int. 17. The button-hole member shown in said Richardson patent, 260,050, can be used to form a fastening with a simple stud of the Kraetzer design, can it?

Ans. I see no reason why a stud like that used in the Kraetzer fastener cannot be engaged with the button-hole member shown in patent 260,050. It is true that in said patent the tongue and ball constituting the button are shown as extending parallel with the length of the button-hole member, while a stud like that of the Kraetzer fastener would probably stand at right angles with the length of the button-hole member. The engagement of the button member with the button-hole member would be caused by the yielding of the spring sides to admit the enlarged outer end
19 of the button member and the closing of said sides after the larger part of the button member has passed between them in both cases.

Cross-int. 18. In the button member of the Richardson patent, 260,050, how many wings or yielding sides *d* are there?

Ans. Two.

Cross-int. 19. Would it make any difference, in your opinion, if these two were split up so as to make four?

Ans. In saying that there are two yielding sides I allude to the fact that the continuity of the sides is broken at two points. At one point the continuity is broken by the long slit cut in the material and virtually making the two sides independent of each other at this point, so that they have a considerable freedom of independent movement. At the other point the continuity is broken by a shallow slot, which is intended more to receive the tongue or shank of the button member than to give elasticity to the spring sides, so that the yielding of the sides is like the yielding of the sides of a ring cut through at one point. In my opinion, if the yielding sides were separated by deep slits so as to make four divisions, the durability of the button member would be impaired, because each division would be much more likely to be permanently bent out of place than in the construction shown in the patents in question.

Cross-int. 20. Do you find that the spring you have last described and the one shown in said Richardson patent, No. 260,050, and also the one shown in the Kraetzer fastener referred to are substantially of the same character—equivalents of each other?

Ans. I think they are.

Cross-int. 21. In speaking of the first claim of the Richardson patent, No. 300,508, I notice you say, "I do not understand that the attaching device of the Richardson patent must be integral with the spring sides," and quote some parts of the specification. I presume you have not familiarized yourself with the file-wrapper and contents of this patent, and therefore in asking this question I call your attention to the first question of the examiner, which may, perhaps, account for the specification and lead you to believe that the claim should be construed as it reads.

The examiner says, "The device is indefinitely described
20 and in such sweeping terms as to cover almost any form of fastener with spring arms. * * * In the present close state of the art there is no warrant for any such broad presentation of the case, and it should be limited to a single definite invention before further action."

In view of the state of the art and what the file-wrapper and contents of this patent discloses, do you find the invention described and claimed in the first claim of the Richardson patent, No. 300,508, in the Kraetzer fastener?

(Objected to. A patent is a grant from the Government, to be construed like any other deed by its own terms and by the terms of any other previous limiting deed. The vagaries of an examiner in the Patent Office are utterly irrelevant and incompetent to prove either the state of the art prior to the grant of the patent or the proper construction of the patent or anything else but his own somewhat irregular use of English, and are of no consequence either to the court or a witness, not being, for the purpose of the construction of a patent, even evidence under oath.)

Ans. I am of the opinion that the Richardson patent, 300,508, showing and claiming a socket or cup-shaped member of a fastening having spring sides, flanges a^2, and an integral fastening or attaching device, is the first instance of the conjoint use of a socket having yielding spring sides adapted to receive and retain a button member between them. I am also of the opinion that the word "integral" in the claim of this patent does not limit the claim to a fastening in which the fastening or attaching device and the socket are made in one and the same piece of material. An integer is a whole or complete thing, not necessarily made in a single piece or seamless.

For these reasons I am of the opinion that the invention described in the Richardson patent, 300,508, and claimed in the first claim thereof is found in the Kraetzer fastener.

Cross-int. 22. Then, as I understand you, in the Richardson patent, 260,050, there is no conjoint use of a socket having yielding spring sides adapted to receive and retain a button member between them. Am I right?

Ans. In my last answer I omitted to name the elements with which the socket having yielding spring sides is used, and I qualify
21 said answer by stating that the said Richardson patent is the first instance of the conjoint use of a socket having yielding spring sides adapted to receive and retain a button member between them, a fastening or attaching device accompanying and connected to the socket and flanges a^2, constituting a seat to bear upon one side of the material and co-operate with the fastening or attaching device in securing the button-hole member to the material. The Richardson patent, 260,050, certainly has a socket having yielding spring sides adapted to receive and retain a button member between them.

Cross-int. 23. What is the distinguishing novelty, if any, in the Richardson patent No. 300,508 with relation to the Richardson patent 260,050?

Ans. Patent 300,508 shows an eyelet or attaching device secured to the socket and surrounded by a flange or seat which bears against one side of the material to which the button-hole member is applied, the fastening device when upset or bent to secure the member bear-

ing on the opposite side of the material. This construction is not found in patent 260,050.

Cross-int. 24. Do you find the same socket in the two patents referred to?

Ans. Substantially the same, although differing in form.

Cross-int. 25. Do you find the same sort of yielding sides, or that each is a fastener with spring arms?

Ans. Yes; practically so, although the yielding sides shown in patent 300,508 would probably have a greater yielding movement than those shown in 260,050, because they are longer from their bases, where they are attached to the body of the socket, to their outer ends or grasping edges.

Cross-int. 26. Referring to patent No. 300,509, to the first claim thereof, do you place any special construction upon the phrase "the ball member thereof fastened to the article upon which it is used, substantially as described?"

Ans. I consider this to imply that the ball member is suitably fastened to the article on which it is used.

Cross-int. 27. You would not limit it in any way?

Ans. Not to any particular means of fastening nor to any particular form of ball member.

22 Cross-int. 28. The Kraetzer fastening well illustrates as a whole—button member and button-hole member included—the construction you have put upon this first claim of patent 300,509, does it not?

Ans. It does.

Cross-int. 29. I notice that you find the elements of this patent 300,509 in the Kraetzer device. Will you please point out more particularly than you have done, in the Kraetzer device, "the socket member having the upper surface adapted to be ornamented, and downwardly extending yielding sides adapted to inclose the other member of the fastening device upon its edge and upper surface, all substantially as and for the purpose described"?

Ans. I was in error in specifying the fifth claim, which I do not think covers the Kraetzer device.

Cross-int. 30. The only claim of this patent, No. 300,509, as I understand you, which you find embodied in the Kraetzer device is the first claim. Am I right?

Ans. You are.

Cross-int. 31. The only claims of the Richardson patent, 260,050, which you find embodied in the Kraetzer device are the first and second claims, are they not?

Ans. Yes.

Cross-int. 32. And the only claim of the Richardson patents, 300,508, 300,509, and 300,510, which you find embodied in the Kraetzer patent is the first claim of each of these patents, is it not?

Ans. Yes.

Cross-int. 33. The only claims of the Mead patent, No. 325,688, which you find embodied in the Kraetzer device, as I understand it, are claims 4, 6, and 7?

Ans. Yes.

Cross-int. 34. Is there any difference between the button-hole member of the Richardson patent 300,508 and the button-hole member of the Richardson patent 300,510, except that the fastening or attaching device is separate from the spring arms?

Ans. I do not now think of any other difference.

Cross-int. 35. You will notice that the Richardson patents,
23 Nos. 300,508, 300,509, and 300,510, were all taken out on the same day—June 17, 1884. In view of your last answer do you still put the same construction upon the first claim of patent No. 300,508, that the fastener or attaching device may not be integral with the rest of the fastening?

Ans. I see no reason to change my opinion. Patent 300,510 shows what was not shown but was only suggested in patent 300,508, viz., the fastening device made in a separate piece from the socket.

Cross-int. 36. In the Richardson patent, No. 300,510, the first claim speaks of a combination of two parts, viz., a section having the flange a^5 and the yielding sides a^2 and an eyelet, b^1, having a flange, b^2, and the end section b turned within the recess formed by the flange a^5.

Please point out in the Kraetzer device, first, the section having the flange a^5 and the yielding sides a^2.

Ans. The section having the flange a^5 and the yielding sides a^2 is in the Kraetzer fastener the casing containing the cut ring which grasps the button member. The flange a^5 is the disk or washer on which the cut ring rests, and the yielding sides a^2 are found in the said cut ring.

(Adjourned.)

SEPT. 15, 1887.

Cross-int. 37. How many parts in the Kraetzer fastener compose what you consider to be the equivalent of the section having the flange a^5 and yielding sides a^2 in the button-hole member of the Richardson fastening in patent 300,510?

Ans. There appear to be three pieces assembled to make the part referred to, viz., the eyelet-shaped part, having a larger and a smaller end; the disk or washer, the edge of which is turned over upon the larger end of the eyelet-shaped part, and the cut ring which is contained in the casing formed by the eyelet-shaped part and the disk or washer.

Cross-int. 38. Please point out the eyelet b^1 having a flange, b^2, and end section b in the Kraetzer fastener.

Ans. Referring to Exhibit Brown Drawing and the figure marked
"Kraetzer No. 4" thereon, the eyelet is the part marked
24 "b^1." The parts marked respectively "b" and "b^2" on said figure are the end section and flange referred to.

Cross-int. 39. In view of the fact that the only difference, as you have already stated, between the Richardson patents, No. 300,508 and No. 300,510, is that the fastening or attaching device of the button-hole member is separate from the spring arms of that member and of Richardson's previous patents and of the prior state of

the art generally, what do you consider to be the invention, if any, in the Richardson patent, No. 300,510?

Ans. In the Richardson patent, 300,510, the part which bears upon the under or inner side of the material is a broad flange, b^2, formed prior to the attaching operation and presenting a smooth, unbroken surface. In the Richardson patent, 300,508, the part that bears on the inner or under side of the material is a tube which is upset or spread to form a flange during the operation of applying the device to the material. The flange thus formed is very likely to be split at one or more points, as the upset flanges of eyelets quite generally are, so that the fastening flange which is marked "a" in patent 300,508 is not so neat and ornamental in appearance, and therefore is not so desirable and probably not so strong and durable as the fastening flange which is marked "b^2" in patent 300,510. I therefore consider the invention in the last-named patent to reside in the construction of the device in two parts, as I have described.

Cross-int. 40. Will you please explain how the device described in the fourth claim of the Mead patent, No. 325,688, is embodied in the Richardson patent, No. 260,050, the fourth claim being "a fastening device of the nature described, the inclosing portion composed of a hollow socket centrally secured to the fabric by a button head, F, and with the inclosing portion disposed upon the under side of the flap, substantially as stated"?

Ans. I do not think the device described in the claim quoted nor in any of the claims of the Mead patent is embodied in the Richardson patent referred to.

Cross-int. 41 (*de bene esse*). Is not the only difference between the Mead patent, 325,688, and the Richardson patent, 325,698, that Richardson secures to his socket by means of a tack where Mead used a simple rivet?

Ans. Richardson's ssocket is secured by what he calls the capped prong or pointed rivet, and this securing device constitutes the chief difference between the Richardson and Mead patents last referred to.

Cross-int. 42 (*de bene esse*). Is there any other difference at all?

Ans. I see no other, excepting in details such as are referred to in the third claim of the Richardson patent, 325,698.

Cross-int. 43 (*de bene*). What do I understand you, then, is the invention claimed in the Richardson patent, 325,698, in the first claim thereof? Is not the prong or rivet therein shown a necessary element, in view of what you know to be the state of the art in the English patents and in the previous Mead patent?

Ans. I understand the invention claimed to be substantially the combination of a cap, a socket, and a prong or pointed rivet which connects the cap and socket, and is secured to one of said parts, and is of such size as to be capable of passing through the material interposed between the cap and socket without requiring the cutting out of a piece of the material to form a hole for its reception. The chief requirement of the fastening device is, in my opinion, that it be secured to one of the parts which it connects, and that it be of such size as to render it unnecessary to cut away the material for its re-

ception. In other words, a fastening device capable of being bent or clinched, and of passing through an orifice formed by penetrating, and not necessarily by cutting out the material to which the device is secured, and therefore having the characteristics of the prong or pointed rivet shown in the Richardson patent, 325,698, is a necessary element.

Cross-int. 44 (*de bene*). Do you find the invention described in the first claim of the Richardson patent, 325,698, embodied in the Mead patent, 325,688; and, if not, why not?

Ans. I do not; because the device in the Mead patent which connects the cap and socket is an eyelet formed independently of the parts which it connects, and necessarily of such size as to require the cutting out of a piece of the material to form a hole for the reception of said eyelet.

26 Cross-int. 45 (*de bene*). Are the spring arms shown in the Mead patent and the Richardson patent 325,698, last referred to, similar to the spring arms in the Richardson patent 300,508?

Ans. They appear so to me.

CHARLES F. BROWN.

Attest: STEPHEN THACHER,
Special Examiner.

SEPT. 19, 1887.

By agreement of counsel patent No. 325,698 is to be considered as set up in complainant's bill of complaint instead of patent No. 525,699, now set up therein by clerical error.

Attest: STEPHEN THACHER,
Special Examiner.

(Adjourned.)

SEPT. 20, 1887.

Complainant's counsel offers in evidence the articles of association of the complainant corporation, with certificate of record indorsed thereon, which it is agreed may be extended by the magistrate upon this record and the original returned to complainant.

Also certificate of change in the subdivision of the capital stock from a gross capitalization of a hundred thousand dollars, a par of not less than ten dollars, and a number of shares of ten thousand, to a gross capitalization of one hundred thousand dollars, as before; a par of fifty dollars, a number of shares of two thousand, with certificates of record indorsed thereon, concerning which the same agreement is made.

Also certificate of payment of capital stock, with certificate of record indorsed thereon, concerning which the same agreement is made.

Also assignment of Clarence J. Blake to the Ball and Socket Fastener Company, dated 24th of January, 1884, and assignment of William S. Richardson, of same date, to same company, concerning which the same agreement is made.

Attest: STEPHEN THACHER,
Special Examiner.

27 *Articles of Association of the Ball and Socket Fastener Company.*

We, the undersigned, hereby associate ourselves together for the purpose of forming a corporation under the laws of the State of New Hampshire.

The object of the said corporation is to manufacture, or cause to be manufactured, and put upon the market and sold, fasteners for gloves and other articles.

The business of said corporation is to be carried on in the city of Nashua, in the State of New Hampshire.

The capital stock to be paid in is one hundred thousand dollars ($100,000), and payments for said stock shall be made, if the company shall so vote, in patents alone, or patents, machinery and other property at an agreed valuation; the par value of the shares shall not be less than ten dollars, and the number of shares shall be ten thousand.

The first meeting of the corporation shall be held in Nashua, in the State of New Hampshire, on the nineteenth day of January, 1884.

P. K. DUMARESQ.
WM. A. NEWELL.
W. S. RICHARDSON.
PAUL F. FOLSOM.
JOSIAH B. CHASE.

We, the undersigned, being all the subscribers to the articles of association of the Ball and Socket Fastener Company, hereby unite in calling the first meeting of the company at Nashua, N. H., on the nineteenth day of January, 1884, at 2.30 o'clock p. m.

P. K. DUMARESQ.
WM. A. NEWELL.
W. S. RICHARDSON.
PAUL F. FOLSOM.
JOSIAH B. CHASE.

28 Indorsed.

STATE OF NEW HAMPSHIRE, SECRETARY'S OFFICE.

Received and recorded this eighteenth day of January, 1884.

[SEAL.] A. B. THOMPSON,
Secretary of State.

NASHUA, N. H., *Jan.* 19, 1884.

Received at 1.40 p. m. and recorded.

R. A. ARNOLD, *City Clerk.*

A true copy of the articles of association of the Ball and Socket Fastener Company and of the indorsements thereon.

Attest: STEPHEN THACHER,
Special Examiner.

I, E. B. Towne, clerk of the Ball and Socket Fastener Company, certify that on the twenty-first day of January, 1884, at a meeting of said company held at Nashua, in the State of New Hampshire, the following vote was passed, to wit:

Voted, that the capital stock be one hundred thousand dollars, divided into two thousand shares of the par value of fifty dollars each.

A true copy of record.
Attest: E. B. TOWNE, *Clerk.*

NASHUA, *Sept.* 17, 1887.

Received and recorded, City Records, vol. 3, p. 443.
[SEAL.] E. M. BOWMAN, *City Clerk.*

STATE OF NEW HAMPSHIRE, SECRETARY'S OFFICE,
CONCORD, *Sept.* 17, 1887.

Recorded in records voluntary corporations, vol. 4, p. 90.
Witness the seal of the State.
[SEAL.] DARIUS MERRILL,
Deputy Secretary of State.

29 A true copy of the certificate of change of subdivision of its capital stock, etc., by the Ball and Socket Fastener Company and the indorsements thereon.
Attest: STEPHEN THACHER,
Special Examiner.

BOSTON, *Feb.* 8, 1884.

The undersigned, a majority of the directors and the treasurer of the Ball and Socket Fastener Company, a corporation organized under and by virtue of the provisions of the General Laws of the State of New Hampshire, in pursuance of the requirements of section 20, chapter 149, of said laws, hereby declare and certify upon oath that the capital stock of said corporation is fixed and limited at one hundred thousand dollars, and the whole of said capital has been paid in by the conveyance to the said corporation by Clarence J. Blake, trustee, of Boston, of American letters patent No. 197,176, to William S. Richardson for fastening device for gloves and other articles; No. 253,228, dated Feb 7, 1882, to William S. Richardson, for the same; No. 260,050, dated June 27, 1882, to William S. Richardson, for the same; No. 276,714, dated May 1, 1883, to William S. Richardson, for the same; British letters patent No. 2267, dated May 13, 1882, to William Robert Lake, for the same; French letters patent No. 149,129, dated May 23, 1882, to Richardson and Dumaresq, for the same; German letters patent No. 24107, dated Feb. 25, 1883, to William Streeter Richardson, for the same; Austrian letters patent No. 14602, dated June 7, 1883, to W. S. Richardson and P. K. Dumaresq, for the same; and Italian letters patent No. 474, 14438, dated July 31, 1882, to Richardson and Dumaresq, for the same.

W. S. RICHARDSON.
JOSIAH B. CHASE.
PAUL F. FOLSOM.

30 STATE OF MASSACHUSETTS, *County of Suffolk,* } ss:

BOSTON, *Feb.* 8, 1884.

Then personally appeared the above-named William S. Richardson, Josiah B. Chase, and Paul F. Folsom, and made solemn oath that the foregoing declaration by them subscribed is true.

Before me—

[SEAL.] BEVERLY K. MOORE,
Notary Public.

Indorsed.

NASHUA, N. H., *Feb.* 19, 1884.

Received and recorded in City Records, vol. 3, page 141.

R. A. ARNOLD, *City Clerk.*

A true copy of the certificate of payment of capital stock of the Ball and Socket Fastener Company and of the indorsement thereon.

Attest: STEPHEN THACHER,
Special Examiner.

Assignment.

In consideration of one dollar and other good and valuable consideration to me in hand paid by the Ball and Socket Fastener Company of Nashua, N. H., the receipt whereof is hereby acknowledged, I have assigned, sold, set over, and conveyed, and by these presents do assign, sell, set over, and convey, unto said Ball and Socket Fastener Company all my right, title, and interest, as trustee, in and to the inventions described in the following-named letters patent:

1. United States letters patent No. 197,176, to William S. Richardson, for fastening device for gloves and other articles.

2. United States letters patent No. 253,228, dated Feb. 7, 1882, to William S. Richardson, for fastening device for gloves and other articles.

3. United States letters patent No. 260,050, dated June 27,
31 1882, to William S. Richardson, for fastening device for gloves and other articles.

4. United States letters patent No. 276,714, dated May 1, 1883, to William S. Richardson, for fastening device for gloves and other articles.

5. British letters patent No. 2267, dated May 13, 1882, to William Robert Lake, for improvements in fastening devices for gloves and other articles.

6. French letters patent No. 149,129, dated May 23, 1882, to Richardson and Dumaresq, for fastenings for gloves and other articles.

7. German letters patent No. 24107, dated Feb. 25, 1883, to William Streeter Richardson, for fastenings for gloves and other articles.

8. Austrian letters patent No. 14602, dated June 7, 1883, to W. S. Richardson and P. K. Dumaresq, for fastenings for gloves and other articles.

9. Italian letters patent No. $\left\{\begin{matrix}474\\14438\end{matrix}\right\}$, dated July 31, 1882, to Richardson and Dumaresq, for fastenings for gloves and other articles.

Also in and to said letters patent and each of them.

Also all my right, title, and interest in and to a certain contract with John E. White, of New York, concerning the manufacture and sale of the said inventions in Germany, Austria, and Italy.

Also all my right, title, and interest in and to any and all inventions which may have been assigned to me as trustee by the said William S. Richardson, or by Philip K. Dumaresq, not enumerated in the above list, and the patents which may be obtained therefor, the same, together with all extensions and reissues thereof, to be held by the said Ball and Socket Fastener Company, its successors and assigns, to the full end of the term for which said letters patent may be granted and for the term or terms of any and all extensions and reissues thereof.

In witness whereof I have hereunto set my hand and seal this twenty-fourth day of January, A. D. 1884.

CLARENCE J. BLAKE. [SEAL.]

In presence of—
JOHN H. BLAKE.

32 A true copy of assignment from Clarence J. Blake to the Ball and Socket Fastener Company.

Attest: STEPHEN THACHER,
Special Examiner.

Assignment.

In consideration of one dollar paid Clarence John Blake, trustee, of Boston, Mass., by the Ball and Socket Fastener Company of Nashua, N. H., and in consideration of one dollar to me in hand paid by said company, receipt whereof is hereby acknowledged, I have assigned, sold, set over, and conveyed, and by these presents do assign, sell, set over, and convey, unto said Ball and Socket Fastener Company all my right, title, and interest in and to the inventions described in my applications for letters patent of the United States for improvement in fastening for gloves and other articles, filed April 20, 1883, serial No. 92349, and serial No. 115,042, and filed Dec. 19, 1883, and one executed Jan. 19, 1884, and in and to the letters patent to be obtained therefor.

Also all my right, title, and interest in and to the invention described in my application for Canadian letters patent, filed Dec. 14, 1883, and in and to said letters patent.

Also all my right, title, and interest in and to a certain invention relating to dies for the manufacture of ball and socket members of the fastening, assigned to me by A. G. Mead Jan. 22, 1884.

Also all my right, title, and interest in and to such inventions as I have made or may make pertaining to fastenings for gloves and other articles containing the ball and socket principle, and all patents which I may obtain therefor, the same, together with all reissues and extensions thereof, to be held by the said Ball and Socket Fastener Company, its successors and assigns, for the respective terms of said patents and all reissues and extensions thereof, as fully and entirely as I would have held and enjoyed the same had this assignment and sale not been made.

Witness my hand and seal this twenty-fourth day of January, A. D. 1884.

WILLIAM S. RICHARDSON. [SEAL.]

In presence of—
JOHN H. BLAKE.

33 A true copy of assignment from William S. Richardson to the Ball and Socket Fastener Company.

Attest: STEPHEN THACHER,
Special Examiner.

BOSTON, *Sept.* 20, 1887.

The evidence for complainant in this case is here closed.

Attest: STEPHEN THACHER,
Special Examiner.

Evidence for Defendant,

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, Albert E. Leach, special examiner.

BOSTON, *Dec.* 2, 1887.

Present: W. B. H. Dowse, Esq., of counsel for defendant; Thomas W. Clarke, Esq., of counsel for complainant.

Deposition of Chandler Hall.

Direct examination by W. B. H. DOWSE, Esq., of counsel for defendant:

Int. 1. What is your name, age, residence, and occupation?

Ans. Chandler Hall; age, thirty-two; residence, 211 Lincoln place, Brooklyn, N. Y. I am engaged in business as a member of the firm of Brown & Hall, 262 Broadway, New York city, as a solicitor of patents and an expert in patent causes.

Int. 2. What experience have you had in the practice of your profession and in mechanical arts, and have you ever been called to testify as an expert in suits relating to patents in United States courts?

34 Ans. For several years I was engaged in the machine business as a workman and later as a superintendent and mechanical draughtsman. For many years last past I have been engaged

in preparing applications for patents and in prosecuting such applications before the Patent Office, in making searches to ascertain the state of the art relating to different inventions, and generally in the examination of patents and patented inventions. I have many times given testimony as an expert in suits in United States courts for infringements of letters patent. I have prepared many applications for fastenings to be used as substitutes for buttons and have served as expert in suits relating to buttons.

Int. 3. What experience, if any, have you had in the manufacture of metallic articles?

Ans. I have designed machinery for making articles of various kinds from sheet metal, and in my machine-shop experience I became familiar with the manufacture of such articles sufficiently to enable me to determine the character of the metal or the composition which should be used for making various sheet-metal articles according to the use to which the articles were to be put.

Int. 4. Have you examined and do you understand United States letters patent No. 260,050, granted June 27, 1882, to William S. Richardson; No. 300,508, No. 300,509, and No. 300,510, granted June 17, 1884, to same; No. 325,688, granted Sept. 8, 1885, to Albert Gallatin Mead, and No. 325,698, granted Sept. 8, 1885, to the same Richardson; and, if so, will you state whether or not, in your opinion, the things described in the said several letters patent and set forth in the several claims or either of them of said patents are capable of being embodied in one and the same fastening or are so embodied in the fastening which complainant's counsel has offered in evidence in this case and marked "glove with Kraetzer fastening," giving your reasons for any opinion you may express?

Ans. I have carefully examined and understand the several letters patent referred to and am clearly of the opinion that the several inventions described in said letters patent are not capable of being embodied in one and the same fastening and are not so embodied in the said Kraetzer fastening.

Mr. Brown, complainant's expert, alleges that eight claims
35 only out of the entire number, thirty-three, are found embodied in the said Kraetzer fastening, and that the other twenty-five claims are not so embodied. I need, therefore, give my reasons with reference to these eight claims only.

Considering first the first and second claims of the Richardson patent 260,050, I find that Mr. Brown, complainant's expert, omits in quoting the first claim the very important words "as described, all as set forth," which are at the end of that claim. On referring to the specification to ascertain what is described and set forth, I find that the "spring-yielding sides *d*" of the socket are formed by slotting the socket at points diametrically opposite each other, and that the tongue of the ball is a laterally extending tongue or arm, and that therefore the fastening provided for securing a glove with its opposite flaps meeting simply, and not lapping, as they do in the Complainant's Exhibit Glove with Kraetzer Fastening.

If it be held that any resilient button-hole member having yielding

sides is the one referred to in the said claim, and that any stud having a head and an axial shank, whereby it is attached to the fabric, is the ball and tongue referred to in said claim, as contended by Mr. Brown, then I find the same combination in the English patent to Schloss, No. 1450 of 1870; in the French patent to Schloss in 1872, No. 95127; in the English patent to Bayer, No. 809 of 1877; in the United States patents No. 218,864, granted Aug. 26, 1879, to C. Downs, and No. 227,446, granted May 11, 1880 to A. G. Mead, and No. 260,411, granted July 4, 1882, to E. Pringle, in view of the statement in the Richardson specification that "the spring or yielding part of the device, instead of being in the sides of the socket, may be in the ball, the ball being constructed to have sides which yield automatically in relation to each other to diminish its diameter upon being inserted into the socket, and springing out again to its original shape when the pressure upon the sides is released." I also find the same combination in the English patent to Vogl, No. 2590 of 1862; in the United States patent No. 79800, granted July 14, 1868, to A. A. Abbott; No. 108,491, granted Oct. 18, 1870, to H. T. Lee; No. 129,255, granted July 16, 1872, to I. J. Saunders. Mr. Brown, therefore, in order to find in said Kraetzer fastener the mechanism referred to in the first claim of the
36 aforesaid Richardson patent, claims to find set forth in said claim a mechanism which is also found in the several prior patents referred to by me.

If the combination of said first claim is the socket B having the spring-yielding sides *d*, and the ball having a lateral tongue, "as described," and "all as set forth" in the Richardson specification, then such combination is not found in the Complainant's Exhibit Glove with Kraetzer Fastening.

This opinion holds good as to the second claim of the Richardson patent No. 260,050. If the device set forth therein is a socket, B, having an opening, C, and the yielding sides *d*, "all substantially as and for the purposes described" in the Richardson patent, then I do not find such device embodied in the Complainant's Exhibit Glove with Kraetzer Fastening. If the device set forth in said claim is any "socket with spring-yielding sides about the circular opening to the socket," then I find such a device in the above-referred-to English patents to Schloss and Bayer.

With reference to both the Richardson claims, the fastener of the Platt patent, No. 181,979, granted Sept. 6, 1876, particularly shows what Mr. Brown contends that he finds set forth in the said claims.

Turning now to the first claim of the Richardson patent No. 300,508, I find it very specific in its language, it being for "a socket or cup-shaped member of a glove or other fastening having spring sides, the flanges *a*, and an integral fastening or attaching device, all substantially as described.

Mr. Brown, in considering this claim, omits the final words, "all substantially as described," and, having omitted these words, contends that the glove with Kraetzer fastening embodies the mechanism of this claim, although he admits that the spring sides of that socket are not formed integral with the socket. He argues spe-

ciously, because the specification states that the tubular fastening may be made separate from and secured to the device, that it follows that the spring sides also may be made separate from the device. In that case the device would not be the device set forth in the claim "all substantially as described." If the spring sides of the Richardson device be not made integral with the fastening device, then I find substantially the same thing in the Schloss French patent above referred to, and in the United States patent to Church,
37 No. 227,094, granted May 4, 1880, I find a device having the same integral tubular securing device like that of the Richardson claim.

A certified copy of the Patent Office file-wrapper and contents shows that Richardson only obtained this claim after repeated attempts to obtain claims which did not include all the three elements named in the said first claim, and that said first claim was granted only because it set forth in definite language the device containing the several elements or features, "all substantially as described." I therefore do not find the device of the first claim of Richardson patent No. 300,508 embodied in Complainant's Exhibit Glove with Kraetzer Fastening.

Turning now to the first claim of the Richardson patent No. 300,509, Mr. Brown contends that it sets forth a mechanism differing from that shown in the patent No. 260,050 chiefly "in that the socket member has its mouth towards the surface of the article to which it is fastened," and as this feature is found in the Kraetzer fastener he intimates that the Kraetzer fastener embodies the mechanism set forth in the aforesaid first claim.

Having the socket with its mouth towards the surface of the material is the oldest possible feature in a fastening of this class, and is shown in the Schloss English and French patents and in the United States patents to Downs, Pringle, and others above referred to. The said first claim does not define the ball, save that it is fastened to the article on which it is used "substantially as described," and I find that it is so fastened by means of a laterally extending tongue, and Kraetzer's fastening has no such tongue. If any headed stud is to be included in said claim, the shank of the stud being the same thing as the tongue, then I find the mechanism set forth in said claim shown and described in the French and English patents to Schloss, in the English patent to Bayer, and the United States patents to Downs and Pringle, all above referred to.

For the above reasons I am clearly of the opinion that the mechanism set forth in the first claim of the Richardson patent, No. 300,509, is not found in Complainant's Exhibit Glove with Kraetzer Fastening.

Turning now to claim one of the Richardson patent, No. 300,510, I find it of the most specific character, "a member of a fast-
38 ening for gloves and other articles, consisting of a section having the flange a^3, yielding sides a^2, and an eyelet b^1 having a flange b^2 and end section b turned within the recess formed by the flange a^3, all substantially as and for the purposes set forth."

Figs. 3 and 6 of the drawing of Richardson patent best show the

parts referred to in this claim. The flange a^5 is turned inwards, and the end b of the eyelet b^1 turns outwards into the recess above this flange a^5, and the patent describes no other way of securing the parts together. The Schloss French patent above referred to shows in Fig. 14 substantially the same combination of the two parts of a button-hole member, and the United States reissued patent No. 3307, granted Feb. 23, 1869, to Capewell, and No. 118,640, granted Aug. 29, 1871, to Platt, show substantially the same way of combining a button with its fastening eyelet, for in both patents the end of a fastening eyelet is spread outwards into a recess formed by a flange (like a^5 of the Richardson patent) turned inward on the other part.

The attempt made by Mr. Brown to show that Complainant's Exhibit Glove with Kraetzer Fastening embodies the mechanism so specifically set forth in the said claim of Richardson's patent is utterly preposterous. It is true that in such Kraetzer device the spring holder or shell has an extension or tubular flange which passes through an opening in the dome top and is turned over upon the dome, so as to hold the two parts in place on the fabric. This is a totally different combination from that formed by the turning outward of the eyelet b^1 of the Richardson claim into the recess formed by the inwardly turned flange a^5 of that claim.

I cannot find the mechanism set forth in claim 1 of Richardson's patent, No. 300,510, embodied in the Exhibit Glove with Kraetzer Fastening.

With respect to Richardson's patent No. 325,698, I do not find the mechanism of the first claim embodied in glove with Kraetzer fastening. The subject-matter of said claim is as follows: "The fastening device comprising a capped prong or pointed rivet C and the socket D secured to the cap by the prong or pointed rivet, as described, all substantially as and for the purposes set forth."

The advantages of thus securing the button-hole device are
39 that the prong or pointed rivet does not necessitate the punching of a hole in the leather or other fabric, but can by a reasonable pressure be forced through such fabric; also that a button-like top or dome having no opening is formed upon the button-hole member, thus giving it a neat finish.

In this class of fasteners it was old to give the button-hole member a closed or dome-shaped top or finish, and such feature is in the Schloss French and English patents, in Bayer's English patent, and in the Dowler English patent No. 795, dated Feb. 13, 1883. Moreover, the Kraetzer button-hole member has not a closed top or dome, but one which is perforated at the centre to receive the tubular extension of the spring holder, which secures the dome in place.

The several prior patents of Schloss, Bayer, and Dowler all show fasteners in which the resilient or spring member is substantially in the plane of the fabric, and hence this feature of the Richardson device was not a novelty at the time of his alleged invention. The tubular shank of Kraetzer spring holder or case is not a "prong or pointed rivet," and does not exercise the function of one which is to

spread or force aside the fibres of the fabric without abutting against and tearing them, and for this reason I do not find in the Complainant's Exhibit Glove with Kraetzer Fastening the mechanism of the first claim of the Richardson patent No. 325,698.

In my opinion, the mechanism of the fourth claim of the Mead patent, No. 325,688, is fully shown in the English patent to Dowler, No. 795, dated Feb. 13, 1883, for in that patent I find, in a fastening for gloves, a button-hole member having "the enclosing portion composed of a hollow socket centrally secured to the fabric by a button head, and with the enclosing portion disposed upon the under side of the flap."

I also find in said English patent to Dowler the mechanism embodied in a fastener which is set forth in the sixth claim of the Mead patent, for in said Dowler patent I find shown and described a member of a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it is centrally attached to the fabric.

It is true that in the Dowler patent the rivet or eyelet, whereby the socket and button head are connected, is not a separate part, as in Mead's device, but is an integral part of the button head; so also in the Kraetzer fastener the rivet is not a separate part, but is an integral part of the spring case or holder.

The Schloss and Bayer English patents above referred to also show substantially the mechanism referred to in the fourth and sixth claims of the Mead patent. In each of the referred-to claims of the Mead patent the socket, which is "included substantially as stated" (or set forth), is a socket having spring sides capable of spreading to admit the ball or head of a stud, and to then close around the shank of the stud, and, as in the Kraetzer fastener, the main socket which is secured to the fabric does not expand and contract. I am clearly of the opinion that the mechanism of the fourth, sixth, and seventh claims of the Mead patent is not embodied in the Complainant's Exhibit Glove with Kraetzer Fastening.

Considering the several Richardson patents and the Mead patent upon their faces—that is, upon their drawings and specifications—it is a preposterous statement that they can be embodied in one and the same device. A button-hole member or socket cannot be constructed at the end of an arm or tongue through which it is secured to the fabric, as in the Richardson patents, Nos. 260,050 and 300,509, and at the same time be constructed with an integral central fastening eyelet, as in Richardson's patent, No. 300,508, or at the same time be centrally secured to a dome head or cap, as in Richardson's patent, No. 325,698, and in Mead's patent. Neither can a button-hole member be secured to the fabric at one and the same time by an integral eyelet a, shown in Richardson patent, No. 300,508, and by the independent eyelet b^1, having its end turned outward into the recess formed by the flange a^5 in the patent No. 300,510. Neither can the buttonhole member or socket of one and the same device have its open mouth presented outwards, as in Richardson's patent, No. 260,050, and also presented inwards, as in Richardson's patents, No. 300,509 and No. 325,698, and as in the Mead patent. Neither

can the socket of a fastening be secured at once by the capped prong or pointed rivet of the Richardson patent No. 325,698, and the eyelet or tubular rivet of the Mead patent.

The state of the art, as I have above shown, is such that it would require no invention to produce the mechanism of the several referred-to claims of the six patents to Richardson and Mead, unless such claims be limited to the mechanism referred to in them "substantially as shown and described" in their several drawings and specifications, and, when so limited, the mechanism positively cannot be embodied in one and the same device, and are not, in fact, so embodied in the Complainant's Exhibit Glove with Kraetzer Fastening.

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(Adjourned.)

BOSTON, *Dec.* 3, 1887.

(Counsel for defendant offers in evidence certified copies of the file-wrapper and contents of the United States letters patent, viz., No. 260,050, granted W. S. Richardson, assignor to C. J. Blake, June 27, 1882; Nos. 300,508, 300,509, 300,510, granted to W. S. Richardson, assignor to the Ball and Socket Fastener Company, June 17, 1884; No. 325,688, granted Albert G. Mead, assignor to the Ball and Socket Fastener Company, Sept. 8, 1885; also No. 325,698, to William S. Richardson, Sept. 8, 1885; also No. 325,699, to W. S. Richardson, granted Sept. 8, 1885, and the same are marked "Defendant's Exhibit File-wrapper and Contents, No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 7."

Defendant's counsel further offers in evidence the following letters patent referred to by Mr. Hall in his last answer: French letters patent No. 95127, granted Joseph Schloss, dated May 2, 1872, and the same is marked "Defendant's Exhibit Schloss French Patent, A. E. L., sp'l ex'r;" English letters patent No. 1450, granted Joseph Schloss May 19, 1870, and the same is marked "Defendant's Exhibit Schloss English Patent;" No. 809, dated Feb. 28, 1877, to Charles Bayer, and the same is marked "Defendant's Exhibit Bayer Patent;" English letters patent No. 2590, of the 22d of September, 1862, to Maurice Vogl, and the same is marked "Defendant's Exhibit Vogl Patent;" also English letters patent No. 795, of Feb. 3, 1883, to Frederick Dowler *et als.*, and the same is marked "Defendant's Exhibit Dowler Patent," all of the above exhibits being marked with the initials of the examiner, A. E. L.

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Defendant's counsel further offers in evidence the following United States letters patent, viz., No. 79800, dated July 14, 1868, to A. A. Abbott, and the same is marked "Defendant's Exhibit Abbott Patent;" No. 108,491, of Oct. 18, 1870, to H. T. Lee, and the same is marked "Defendant's Exhibit Lee Patent;" No. 129,255, of July 16, 1872, to I. J. Saunders, and the same is marked "Defendant's Exhibit Saunders Patent;" No. 218,864, of Aug. 26, 1887, to C. Downs, and the same is marked "Defendant's Exhibit Downs Patent;" No. 227,094, of May 24, 1880, to H. A. Church, and the same is marked "Defendant's Exhibit Church Patent;" No. 260,411, of July 4, 1882, to E. Pringle, and the same is marked

"Defendant's Exhibit Pringle Patent;" No. 266,710, of July 31, 1882, to J. W. Meeker, and the same is marked "Defendant's Exhibit Meeker Patent;" also reissue No. 3307, of Feb. 23, 1869, to J. G. Capewell, and the same is marked "Defendant's Exhibit Capewell Patent;" also No. 118,640, of Aug. 29, 1871, to Clark M. Platt, and the same is marked "Defendant's Exhibit Platt Patent of '71;" also No. 235,144, of Dec. 7, 1880, to D. Essex, and the same is marked "Defendant's Exhibit Essex Patent;" also No. 236,663, of Jan. 18, 1881, to T. C. Bates, and the same is marked "Defendant's Exhibit Bates Patent;" also No. 252,311, of Jan. 17, 1882, to L. Golding, and the same is marked "Defendant's Exhibit Golding Patent;" also No. 331,266, of Nov. 24, 1885, to W. M. Williams, and the same is marked "Defendant's Exhibit Williams Patent;" also No. 281,376, of July 17, 1883, to E. J. Kraetzer, and the same is marked "Defendant's Exhibit Kraetzer Patent No. 1;" also No. 290,067, of Dec. 11, 1883, to E. J. Kraetzer, and the same is marked "Defendant's Exhibit Kraetzer Patent No. 2;" also No. 306,021, of Sept. 30, 1884, to E. J. Kraetzer, and the same is marked "Defendant's Exhibit Kraetzer Patent No. 3;" also No. 359,614, of March 22, 1887, to E. J. Kraetzer, and the same is marked "Kraetzer Patent No. 4;" also No. 359,615, of March 22, 1887, to E. J. Kraetzer, and the same is marked "Kraetzer Patent No. 5;" also No. 227,440, of May 11, 1880, to A. G. Mead, and the same is marked "Defendant's Exhibit Mead Patent of '80;" also No. 181,979, of Sept. 5, 1876, to Clark M. Platt, and the same is marked "Defendant's Exhibit Platt
43 Patent of '76;" also No. 276,714, of May 1, 1883, to W. S. Richardson, and the same is marked "Defendant's Exhibit Richardson Patent of May 1, 1883;" also No. 231,234, of Aug. 17, 1880, to Charles H. Mumford, and the same is marked "Defendant's Exhibit Mumford Patent."

Cross-examination waived by Thomas W. Clarke, Esq., of counsel for complainant, who enters the following objection:

That part of the answer to Int. 4 which refers to the file-wrapper and contents of the Richardson patent, No. 300,508, is objected to as incompetent, as irrelevant, and as *res inter alios acta*.)

CHANDLER HALL.

Attest: ALBERT E. LEACH,
Special Examiner.

BOSTON, *Feb.* 7, 1888.

Counsel for defendant offers in evidence a certified copy or a duplicate of the model filed in the matter of the Platt patent No. 181,979, and the same is marked "Defendant's Exhibit Platt Fastener, Model of Patent No. 181,979;" also fastener marked "Defendant's Exhibit Abbott Fastener, Patent No. 79800;" also fastener marked "Defendant's Exhibit Gooseneck Fastener."

Deposition of Albert G. Mead.

Direct examination by W. B. H. DOWSE, Esq., of counsel for defendant:

Int. 1. What is your name, age, residence, and occupation?

Ans. Albert G. Mead; age, fifty-seven; occupation, machinist; residence, Boston.

Int. 2. How long have you been a machinist?

Ans. Thirty-eight years.

Int. 3. Are you familiar with cutting and forming articles from sheet metal, such as glove fastenings, buttons, and other articles of like nature?

Ans. Yes.

Int. 4. How long have you been familiar with such kinds of work?

44 Ans. About twenty years.

Int. 5. Have you read over Defendant's Exhibit Schlosss Translation and examined the drawings marked "Defendant's Exhibit Schloss French Patent"?

Ans. I have.

Int. 6. Is the description in this patent and drawings last referred to sufficiently clear and full to enable you to produce without experiment a flexible button-hole member and an inflexible stud?

Ans. They are.

Int. 7. I now hand you a strip of leather with a fastener attached and ask you what it is.

Ans. A fastening as described in the Schloss French patent or Defendant's Exhibit Schloss Translation and Drawings.

(Counsel for defendant offers in evidence the fastening last referred to, and the same is marked "Defendant's Exhibit Schloss French Fastener, A. E. L., sp'l ex'r.")

Int. 8. Will you, referring to Defendant's Exhibit Schloss French Patent, point out what figure represents the general construction of Defendant's Exhibit Schloss French Fastener?

Ans. Fig. 14. In it I find the cap H, a washer, *i*, an eyelet, *k*, and a second or outside washer, *m*. All these parts are found in Defendant's Exhibit Schloss French Fastener, except that the opening of the socket or the hole in the washer *i* is, in accordance with the description of the patent, rounded over and rendered flexible by a convenient number of slits, so as to make a flexible socket.

Int. 9. Who made, if you know, Defendant's Exhibit Schloss French Fastener?

Ans. I made it.

Int. 10. How did you know how to make it?

Ans. From the description and drawings of the Schloss patent referred to. I examined the drawings marked "Defendant's Exhibit Schloss French Patent" and carefully read over the translation marked "Defendant's Exhibit Schloss Translation."

Int. 11. Did you have to experiment or not in order to produce Defendant's Exhibit Schloss French Fastener?

Ans. I did not. The parts in the exhibit are the first that I made.

45 Int. 12. Will you state what the exhibit is which I now hand you?

Ans. It is a glove-fastener consisting of a flexible stud and an inflexible button-hole member, like that shown in Defendant's Exhibit Schloss French Patent and described in Defendant's Exhibit Schloss Translation. The stud is like that shown in Fig. 23 and the button-hole member is like that shown in Fig. 14. I made this exhibit myself.

(Counsel for defendant offers in evidence the fastener last referred to, and the same is marked "Defendant's Exhibit Schloss French Fastener No. 2.")

Int. 13. Are the parts in Defendant's Exhibit Schloss French Fastener the same or not in shape and form as the parts of the fastener shown in Fig. 14 of Defendant's Exhibit Schloss French Patent?

Ans. They are the same, except that the washer *i* is turned up around the inner edge or rounded over and cut as described in Defendant's Exhibit Schloss Translation.

Int. 14. Would the information which you gather from Defendant's Exhibit Schloss French Patent and Defendant's Exhibit Schloss Translation have been sufficiently full and clear to have enabled you or, in your opinion, any mechanic familiar with the art and without invention to have produced Defendant's Exhibit Schloss French Fastener at the date of the Platt invention, supposing that to have taken place in 1874, 1875, or 1876?

Ans. I could, and I believe that any mechanic skilled or familiar with the art of making buttons or fastenings could have done so.

(Adjourned.)

FEB. 8, 1888.

Int. 15. Have you ever given especial attention to the making of glove-fasteners; and, if so, how long?

Ans. I have. I have been engaged in mechanical work for thirty-eight years, and I have given special attention to the making of glove-fasteners, buttons, and other articles of like nature for about twenty years.

Int. 16. I now hand you certain devices. Will you say what they are?

46 Ans. The devices given me are glove-fasteners, which substantially represent in working form the glove-fasteners shown in the United States patents No. 325,698, No. 260,411, No. 227,440, No. 260,050, No. 306,021, No. 325,430, No. 325,688, No. 300,510, No. 300,508, No. 300,509; also the fastener shown in Defendant's Exhibit Schloss French Patent.

(Counsel for defendant offers in evidence the following fastenings, and the same are marked—

"Defendant's Exhibit Richardson Fastener, Patent No. 325,698."
"Defendant's Exhibit Pringle Fastener, Patent No. 260,411."
"Defendant's Exhibit Mead Fastener, Patent No. 227,440."
"Defendant's Exhibit Richardson Fastener, Patent No. 260,050,"
"Defendant's Exhibit Kraetzer Fastener, Patent No. 306,021."
"Defendant's Exhibit Mead Fastener, Patent No. 325,430."
"Defendant's Exhibit Kraezter Fastener Initial."
"Defendant's Exhibit Mead Fastener, Patent No. 325,688."
"Defendant's Exhibit Richardson Fastener, Patent No. 300,510."
"Defendant's Exhibit Richardson Fastener, Patent No. 300,508."
"Defendant's Exhibit Richardson Fastener, Patent No. 300,509."
"Defendant's Exhibit K."
"Defendant's Exhibit Schloss French Fastener."
"Defendant's Exhibit Schloss French Fastener No. 2.")

Int. 17. Did you make the exhibits marked "Defendant's Exhibit Richardson Fastener, Patent No. 325,698," "Richardson Fastener, Patent No. 260,050," "Richardson Fastener, Patent No. 300,510," "Richardson Fastener, Patent No. 300,509," "Richardson Fastener, Patent No. 300,508"?

Ans. No; they were handed me by Mr. Dowse, who said that they had been furnished by the complainant, and I simply attached them to the leathers just as they were given to me. I may have made some of the studs, but not the botton-hole members.

47 Int. 18. Did you make Defendant's Exhibit Schloss French Fastener and Defendant's Exhibit Schloss French Fastener No. 2?

Ans. I did and attached them to the leather.

(Cross-examination waived.)

ALBERT G. MEAD.

Attest: ALBERT E. LEACH,
Special Examiner.

Deposition of Albert E. Leach.

Direct examination by W. B. H. DOWSE, Esq., of counsel for defendant:

BOSTON, *Feb.* 8, 1888.

Int. 1. What is your name, age, residence, and occupation?

Ans. Name, Albert E. Leach; age, twenty-three; residence, Newton; and occupation, solicitor of patents.

Int. 2. Do you or not understand the French language?

Ans. I do.

Int. 3. Will you please state whether or not the exhibit marked "Defendant's Exhibit Schloss Translation" is a correct translation of Defendant's Exhibit Schloss French Patent.

Ans. I made the translation. I have carefully compared it with

the original patent, Defendant's Exhibit Schloss French Patent, and I believe it is a correct translation.

(Cross-examination waived.)

ALBERT E. LEACH.

Attest: D. K. STEVENS,
Special Examiner.

Deposition of Joseph P. Livermore.

BOSTON, *Nov.* 27, 1888.

Direct examination by W. B. H. DOWSE, Esq., of counsel for defendant:

Int. 1. What is your name, age, residence, and occupation?

Ans. Joseph P. Livermore; thirty-three years; reside at Cambridge, and am solicitor of patents and mechanical expert.

Int. 2. Will you please state what experience you have had
48 in your profession, especially with reference to testifying in suits relating to inventions and letters patent pertaining thereto.

Ans. I have been occupied as solicitor of patents since 1879—the beginning of 1879—and have had occasion almost daily to examine apparatus of various kind and descriptions and drawings of the same, especially those found in letters patent for inventions. I have prepared numerous specifications for letters patent and have almost daily had occasion to compare devices and descriptions and drawings of devices and apparatus as to their material resemblances and differences. During the last three or four years I have frequently testified as an expert in patent cases relating to a considerable variety of subjects.

Int. 3. Have you examined and do you understand United States letters patent Nos. 300,508, 300,509, 300,510, and 325,688, set up in complainant's bill, and have you read over the testimony of Mr. Brown, complainant's expert in this case?

Ans. I have examined these patents and believe that I understand them, and have also read a printed copy of Mr. Brown's testimony in this case.

Int. 4. Have you examined and do you understand United States letters patent—

No. 60217, dated Dec. 4, 1866, to P. F. Mauvas;
No. 79800, dated July 14, 1868, to A. A. Abbott;
No. 3421, reissue, dated May 4, 1869, to Somers and Atwood;
No. 181,979, dated Sept. 5, 1876, to C. M. Platt;
No. 178,726, dated June 13, 1876, to C. M. Brown;
No. 180,938, dated Aug. 8, 1876, to E. Schnopp;
No. 227,440, dated May 11, 1880, to A. G. Mead;
No. 244,632, dated July 19, 1881, to E. Loewenthal;
No. 241,767, dated May 17, 1881, to J. Whitby;
No. 252,311, dated Jan. 17, 1882, to L. Goulding;
No. 260,411, dated July 4, 1882, to E. Pringle;

No. 276,714, dated May 1, 1883, to W. S. Richardson;
No. 260,050, dated June 27, 1882, to W. S. Richardson;
Also British letters patent—
No. 1450 of 1870, to Joseph Schloss;
No. 809 of 1877, to Charles Bayer;
49 No. 795 of 1883, to Dowler;
Also French letters patent—
No. 95127 of 1872, to Joseph Schloss;
And, if so, will you please state what the inventions and devices are which are shown in these patents?

Ans. I have examined the United States and British patents referred to and the translation of the French patent to Schloss, and believe that I understand the various contrivances shown and described in said patents. They all show and describe buttons, and, with one or two exceptions, all show button fastenings of a kind in which the two members of the fastening attached to the two flaps of a garment or parts of a garment to be fastened are metallic, the said members corresponding to an ordinary button and button-hole, and being so made that the button member, which is in the form of a stud or knob, passes through a slightly contracted opening in the button-hole member, one or the other of said parts being made elastic or resilient, so as to permit the button or knob to be forcibly pressed through the contracted opening, which in one construction yields or expands to permit such passage and afterwards contracts around the neck or shank of the button member, so as to retain the two members of the fastening together until the button is forcibly pulled out of the socket by an operation which is substantially opposite that by which it was forced into the socket.

In the greater number of the contrivances shown in the patents referred to in the question the button-hole member is resilient or has a contracted opening, through which the head of the button is forced by expanding said contracted opening, but in a few of the contrivances the converse of this arrangement is employed—that is, the contracted neck or opening is not expansible, but the knob or button is resilient and is compressed to pass through the opening, and afterwards expands so as to be retained in the opening until again pulled out by a force sufficient to overcome the elasticity of the button and contract it sufficiently to come out through the opening. In some cases both the button and button-hole members are made elastic or resilient, so that the button is permitted to pass into and out of the socket both by the expansion of the button-hole and
50 the contraction of the button. The various patents show various ways of constructing a fastening having these general features and of attaching the different members of the fastening to the fabric or flaps of a garment with which they are to be used.

Int. 5. Will you please examine the complainant's patent No. 300,508, heretofore referred to, and state what the device therein shown and described is, and compare the same with the devices and inventions referred to in the several patents in the last question, setting forth what novelty, if any, there is in complainant's patent No. 300,508, with special reference to the first claim thereof?

Ans. Said patent No. 300,508 shows and describes a metallic fastening of the same general class as those referred to in my last answer, being one in which the button-hole member is resilient and the button member has a spherical knob at the end of a lateral arm or shank, which knob is forced through a yielding or resilient contracted mouth in the button-hole member in fastening and unfastening the garment.

The invention is said to be an improvement on the patentee's prior patents, Nos. 260,050 and 276,714, and it relates mainly to a button-hole member, although certain features of the button member are spoken of as novel and are referred to in the fourth and fifth claims. I understand that the present inquiry relates only to the button-hole member. The first claim is—

"A socket or cup-shaped member of a glove or other fastener having spring sides, flanges *a*, and an integral fastening or attaching device, all substantially as described." This first claim refers to the several features of a button-hole member which, as a complete device, generally is made of a single piece of metal, having all the parts that are necessary for attaching it to a garment and for co-operating with the button member after it has been so attached.

The device is shown as made of a single piece of ductile sheet metal, which is shaped from a plane blank so as to have a tubular portion like the neck of an ordinary eyelet (which portion is the integral fastening or attaching device referred to in the claim), a flange at one end of said neck, which rests against one side of the fabric when the tubular part is forced through a hole in the fabric, so that this flange will co-operate with the end of the neck
51 after the latter has been flared out, and thus serves to attach the device to a garment like an ordinary eyelet, from which it differs only in that it contains the following additional device:

Extending from the flange are two curved converging wings which constitute the spring sides of the socket, the ends of said wings making the contracted opening of the socket through which the ball or button member is to be forced, and said wings being elastic so as to permit such forcing through of the ball member and to subsequently contract and hold the ball member in the fastener or socket. The whole device when attached to a garment by the tubular neck is something like a cup with the bottom and a considerable portion of its sides removed, leaving only the spring sides that embrace the button member. Some few modifications are shown, and they relate mainly to the position of the spring sides with relation to the eyelet or fastening part of the device—that is, these spring sides may project out from the eyelet flange on the side away from the tubular neck, and their bases may extend either from the outer circumference of such flange or from the inner circumference (the latter construction being described as preferable), or they may extend from the inner circumference downwards towards and into the neck instead of outward away from the neck. In all cases the spring sides are two curved wings or arms connected at their bases with the flange of the eyelet and converging from their bases towards their free extremities, and there is no hint or sugges-

tion anywhere in the patent that any other form of spring sides was contemplated or would be within the invention.

Another modification suggested is that the edge of the socket or cup that constitutes the flange may enclose the flange of a second tubular rivet or eyelet, thus making the fastener in two parts, which may be united either before the fastener is secured in place for use or during the act of so securing it. In this construction the two parts would be rigidly fastened together, and the fastener as a whole would be practically of the same nature and have the same mode of operation as the one made wholly of one piece, and the spring sides or wings would be rigidly attached to the fastening part of the device, so that the yielding or spring action will reside wholly in the arms themselves—that is, in their capability of yielding
52 between their rigidly secured non-elastic bases and their extremities. I am therefore of the opinion that the contrivance referred to in the first claim must be a fastener complete in itself, having a flange and a neck, either tubular or pronged, extending therefrom by which it can be attached to the garment, and converging spring arms rigidly held at their bases and yielding at their free ends.

On referring to the various patents to which my attention has been called in the previous question, it is clear that the only novelty, if there be any, in the contrivance shown and described in the Richardson patent, No. 300,508, and referred to in the first claim, must reside in the spring arms or in the contrivance as a whole having such spring arms, as just defined by me, as several of said prior patents show button-hole members having a socket and attaching device by which it is fastened to the garment, said socket having a spring portion or spring member which co-operates with a button member in the same manner as the spring sides of the Richardson fastening. The Platt patent, for example, shows a buttonhole member made in a single piece or in two pieces (as it is suggested that the Richardson device may be made), such piece having a flange that rests against one side of the garment and a tubular neck extending from said flange to pass through a hole in the garment to be turned down in order to attach the device to the garment in the same manner that the tubular neck of the Richardson device does, and the said Platt fastener, with its flange and tubular neck, instead of being a complete annulus, is divided at one side, so as to make a spring ring, which is capable of a slight expansion and contraction circumferentially to permit the button head to pass through and then close around it to hold the button head until again forcibly passed through the button-hole member. This Platt device then has a socket having spring sides and a flange and an internal tubular neck or fastening device, the device differing only from the Richardson contrivance in the specific construction of the several parts referred to.

The Schnopp patent, No. 180,938, also shows a button-hole member having a part by which it is attached and a socket with spring sides, which co-operate with the button member in substantially the same manner as the spring sides of the Richardson fastener, from which

the Schnopp fastener differs only in the specific construction
53 of the attaching part and of the spring sides, which are in the Schnopp fastener several fingers projecting toward one another in one plane, and being forced slightly out from that plane to one side or the other as the button member is forced into and out from its socket.

The Mead patent, No. 227,440, also shows the button-hole member of a fastening having a socket and attaching portion and a spring that co-operates with the knob or projecting part of the button member as it is forced into and out from the socket. This Mead spring is not rigidly connected with and does not form a part of the same piece of metal as the socket and attaching device, but is an independent spring, which nearly surrounds and clasps the neck of the button member.

In view of this Mead patent, it seems to me that the Richardson invention in patent No. 300,508 must be limited to the construction in which the spring sides really are the socket, and that the expression in the first claim of the patent, "the socket * * * having spring sides," must mean a socket made with spring sides, and cannot be expanded to mean a socket and a spring of some kind (which is, as I understand it, the construction put upon it by Mr. Brown) without so broadening its scope as to include the Mead patent, which would anticipate the Richardson invention if so defined.

The socket portion of the Mead fastener as shown is made of two pieces of sheet metal united around their edges, forming a hollow chamber that contains an independent spring that clasps the neck of the button member, and said chamber forms a flange which rests at one side of the garment and co-operates with the tubular neck, which is passed through an opening in the fabric and clinched down upon the other side thereof.

This tubular neck or eyelet is also shown as made in a separate piece from the socket or shell that contains the spring, and the Richardson fastener is consequently distinguished from the Mead fastener, not only by the difference in the spring socket that I have before pointed out, but in the fact that the entire button-hole member, including the tubular neck or fastening device, the flange, and the spring socket, is made in a single piece, or at most in two pieces, rigidly fastened together when the contrivance is attached to the garment.

54 Patent to Loewenthal, No. 244,632, shows the button member of a fastener in which the attaching device and its relation to the socket that embraces the button-hole member is almost identical with that of the Richardson fastener, the difference between the two fasteners being mainly in the socket that co-operates with the button member. In the Loewenthal device this socket is not a spring socket through which the button head is forced, but consists of a plate having an opening large enough to admit the button head without the expansion or contraction of either part, and a lateral slat extending from said opening, which receives the shank of the button and prevents the button head from being removed until

brought into line with the larger part of the opening. In this Loewenthal fastener the part that constitutes the socket proper has its flange edge interlocked with the flange on the fastener portion or eyelet, being substantially like the modification referred to in the Richardson patent, and this Loewenthal patent shows that the novelty of the Richardson device did not consist in making the socket and attaching device complete in a single article, but it consisted only in the specific construction of the socket with spring arms in a device having such a socket and an attaching device, or possibly in making the entire socket and attaching device from a single piece of metal, although the modification referred to in the Richardson patent appears to preclude such construction.

Patent to Goulding, No. 252,311, shows a fastener comprising a button having converging spring sides, the base of which forms a flange that rests on one side of the garment, and when attached to a garment is connected with a tubular fastening device that extends through a hole in the garment and has a flange at the other side thereof. This contrivance in the Goulding patent forms a button member having spring sides which co-operate with a non-elastic socket forming a button-hole member. It is almost the exact converse of the Richardson fastener, the spring button member of the Goulding patent being as near in construction and mode of operation to the spring button-hole member of the Richardson patent as is consistent with the, so to speak, inverted arrangements of said parts, the spring sides of the Goulding contrivance being adapted to contract in passing through a non-extensible annulus, while the spring sides of the Richardson fastener expand while the non-compressible knob or bulb is passing through them.

The Pringle patent, No. 260,411, also shows a button-hole member having a socket containing a spring and a tubular neck by which the device is attached to a garment, there being a washer interposed between the garment and the flange that is formed at the end of the tubular neck in the act of attaching the fastener to the garment. The spring acts only on one side of the shank of the button member, and the construction of the Pringle fastener is considerably different from that of the Richardson fastener, but it clearly precludes the idea that at the time of the Richardson patent there could be any novelty in a button-hole member of a metallic fastener having a socket, a spring, and an attaching device without limitation as to the specific construction of the several parts. The Schloss French patent also shows a fastener having a socket provided with an attaching neck and containing a plate with an opening through which the enlarged end of the button is passed. This plate is not shown in the drawings as made extensible or elastic, but the description states that the opening of the socket could be rounded over and made flexible by a convenient number of slits, so as to be used with an inflexible stud, and the Schloss English patent shows a socket rounded over and made elastic by such a set of slits or notches. The socket member of the Schloss French patent is made in three pieces, and has a flange that engages one side of the fabric and a tubular neck passed through the fabric and clinched against a washer at the other

side, while Schloss' English patent shows a button-hole member made in two parts, each having a flange, between which two flanges the garment is held when the two parts of the fastener are put together. These patents show, therefore, that the only novelty of the Richardson fastener consisted in making the entire device in one piece of metal, or else in the specific construction and arrangement of the spring arms that constitute the elastic socket that co-operates with the button member of the fastener. The Bayer English patent, No. 809 of 1877, also shows a fastener having a button-hole member, the socket of which consists of a ring split at one side so as to open or expand circumferentially like the spring eyelet of the Platt fastener; but such spring of the Bayer fastener lies wholly at
56 one side of the fabric and is fastened thereto by a dome-shaped cap or button head at the other side of the fabric, having prongs that are passed through the fabric and clinched around an expansibly split ring. This Bayer fastener, therefore, is made in two parts, which are put together in the act of attaching the fastener to the garment; but said fastener, when completely attached, has a socket with an elastic or resilient contracted portion and an attaching device.

The Dowler English patent, No. 795 of 1883, also has a button-hole member made in two or three parts and having a cup-shaped socket with spring sides and embodying the means for attaching it to a garment. The spring portion of the socket of the Dowler patent is almost the same in construction and mode of operation as that of the Richardson patent, differing mainly in the location of the flange that rests on one side of the garment with relation to the spring arms, the said flange in the Dowler contrivance being at the ends of the spring arms instead of at the base thereof, as in the Richardson fastener.

In view of all these patents, many of which are several years prior to the date of the Richardson patent, the only novelty in the Richardson fastener consists, as I have before stated, in the construction of the fastener as a whole—that is, in a single device having a socket composed of converging spring arms, the bases of which form or are connected with the flange that rests at one side of the fabric and is connected with the tubular neck or set of prongs to be passed through the fabric and clinched down upon the other side thereof, so as to attach the fastener to the fabric.

Int. 6. Will you please compare the device shown, described, and claimed in complainant's patent No. 300,508, having special reference to the first claim thereof, with the fastener which complainant's counsel has offered in evidence in this case and marked "glove with Kraetzer fastener," giving your reasons for any opinion you may express?

Ans. The Kraetzer fastener is a metallic fastener having a non-compressible stud or button member attached to one flap of a garment and a button-hole member attached to the other flap of a garment, having a contracted elastic passage through which the button head is inserted, being in these general features like nearly

57 all of the contrivances shown in the various patents to which I have already referred.

The button-hole member, when detached from the garment, is in two parts, one of which is placed at one side and the other at the other side of the fabric in attaching the button-hole member to the fabric. It has no single part or assemblage of parts that constitute the entire member of a fastener having proper means for attaching it to a garment and for co-operating with the button when so attached, so that in this respect it is radically different from the fastener shown and described in the Richardson patent No. 300,508. In this feature of its construction the Kraetzer fastener is more nearly like the fastener shown, for example, in the Bayer English patent, No. 809 of 1877, than like the Richardson fastener. The spring that engages the button member of the Kraetzer fastener is a ring or annulus of wire, split at one side, so as to be capable of yielding or expanding circumferentially as the button head passes through, being in its operation more nearly like the spring of the Bayer English patent or the spring eyelet of the Platt patent than like the spring arms of the Richardson fastener. This spring ring of the Kraetzer fastener is not, however, fastened directly to the fabric, but it is loosely held in a chamber composed of two pieces of sheet metal united around their edges, one of which pieces has a tubular extension which passes through the fabric and is engaged with a dome-shaped cap or button head at the other side of the fabric in the act of attaching the fastener to the fabric.

When thus attached the entire spring chamber lies at one side—in this case the under side—of the fabric and the dome-shaped cap is at the other side, the two parts being fastened together so as to hold the fabric between them by the upsetting or flaring out of the tubular neck of the spring chamber in the central opening in the button head or cap.

The spring ring or clasp is wholly different from the spring arms that constitute the socket of the Richardson fastener, and the said spring ring is incapable of co-operating with the button head unless it be enclosed in and to a certain extent loosely connected with the spring chamber, which is capable of being securely attached to the fabric. So far as the general relation of the spring to the

58 part by which it is connected to the fabric is concerned, the Kraetzer fastener is more nearly like the fastener shown in the Mead patent, No. 227,440, than like the Richardson contrivance, as said Kraetzer fastener resembles the Mead button in having a spring to engage a button head, which spring is enclosed in a two-part chamber that rests against one side of the fabric, and is provided with a neck that passes through the fabric, but differs from the Mead button in the specific construction of the spring and spring chamber and in the fact that the spring chamber is at the inner side of the fabric and that its tubular neck is not in itself adapted to attach the spring chamber to the fabric, but must co-operate with a dome-shaped button head at the other side of the fabric to effect its attachment. There is no feature, so far as I can discover, in the Richardson fastener that distinguishes it from the Mead fastener or

the Bayer fastener; or, in other words, no feature of novelty whatever in the Richardson fastener that also exists in the Kraetzer fastener, which differs radically in every feature of construction from the Richardson fastener. In Mr. Brown's comparison of the Kraetzer fastener with the Richardson patent No. 300,508, as illustrated by his diagram, he apparently regards the spring chamber of the Kraetzer fastener as the equivalent for what he calls the socket of the Richardson fastener, and he regards the two sides of the Kraetzer spring ring as the equivalent of the spring arms or sides of the Richardson fastener, and the neck extending from one side of the Kraetzer spring chamber as the equivalent for the tubular neck of the Richardson fastener, while some part of the spring chamber which he has marked indefinitely on his diagram he considers to be the equivalent for the flange at the junction of the neck and spring arms of the Richardson fastener, and by making such parts equivalent he considers that the several members referred to in the first claim of the Richardson patent have equivalents in the Kraetzer contrivance. In order to find such equivalents he was obliged to make the spring sides of the Kraetzer fastener a distinct element from the socket or cup-shaped member; in other words, he interpreted the term "socket or cup-shaped member * * * having spring sides," in the first claim, as meaning a socket and a spring or a socket and spring sides of some kind; but it seems evi-
59 dent that this expression in the first claim must mean a socket composed of or made with spring sides or a spring-sided socket, and referring to the specification in the Richardson patent it says: "The complete fastener thus formed will have * * * the yielding or spring sides a^1 which form the socket a^3;" and referring to Fig. 8 the reference letter a^3 is applied to the opening or space between the spring sides, thus clearly indicating that the same letter a^3 refers to such space in Fig. 11, and not to the inner edge of the tubular neck. The reference letter b used on Mr. Brown's comparative sketch is, therefore, wholly misleading; and it will be noticed that he failed to apply such letter to the form in which the spring arms are turned upward, as in Fig. 8 of the Richardson patent.

I am, therefore, of the opinion that the spring chamber of the Kraetzer fastener is not the equivalent of the socket referred to in the Richardson patent, and that the spring chamber and spring of the Kraetzer fastener are not the equivalent of "a socket or cup-shaped member * * * having spring sides" referred to in the first claim of the Richardson patent.

And, further than this, if that expression does mean a spring chamber and contained spring, or is capable of including a spring chamber and enclosed spring as the equivalent of a socket having spring sides, then the first claim of the Richardson patent would also include the button of the Mead patent, No. 227,440, and the Richardson invention so defined would be completely anticipated by the Mead patent. I have prepared a diagram similar to Mr. Brown's, in which he compares the Richardson and Kraetzer fasteners, and have also placed beside them a similar view of the Mead

button and the one shown in the Schloss English patent, showing that any and all of the features that the Richardson fastener has in common with the Kraetzer device also exist in the Mead button in just as close resemblance to the Richardson as they do in the Kraetzer fastener. The Schloss patent shown in the sketch is more nearly like the Richardson patent in its mode of operation than is the Kraetzer, as the Schloss socket has laterally yielding spring arms.

I have shown only the Mead and Schloss fasteners on this sketch for the sake of simplicity, as there are numerous other but-
60 tons which contain the same elements that Mr. Brown has pointed out as existing both in the Richardson and Kraetzer buttons.

In my opinion, it is plain, therefore, that the Kraetzer fastener does not embody the invention shown and described in the Richardson patent No. 300,508, and referred to in the first claim thereof, and that any construction that may be put upon said claim that would make it include the Kraetzer button would also make it include a large number of prior devices which would fully anticipate the Richardson invention and claim if so construed.

(Adjourned.)

Nov. 28, 1888.

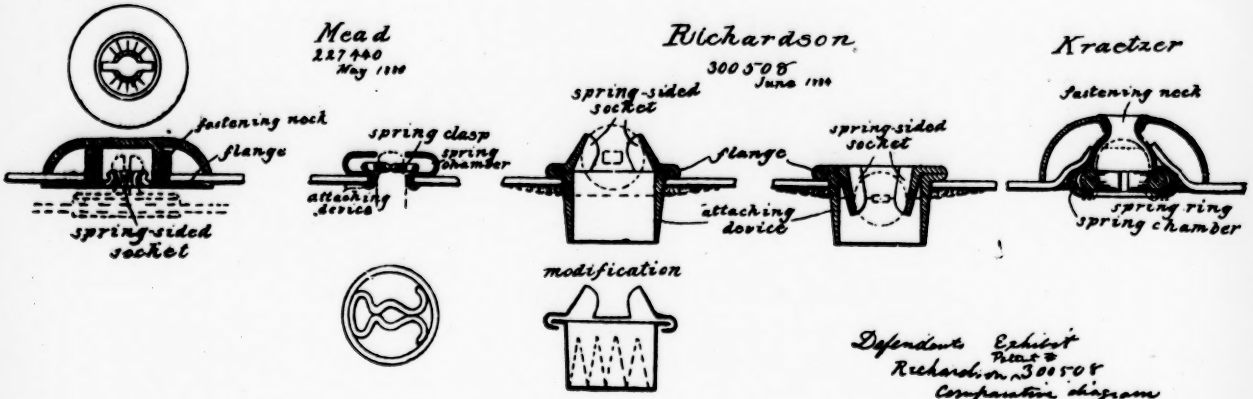
(Counsel for defendant introduces in evidence the diagram referred to by the witness in his last answer, and the same is marked "Defendant's Exhibit Richardson Patent No. 300,508, Comparative Diagram."

(Here follows diagram marked p. 60*a*.)

Int. 7. Will you please examine complainant's patent No. 300,509, heretofore referred to, and state what the device therein shown and described is, and compare the same with the devices and inventions referred to in the several patents in Ints. 3 and 4, setting forth what novelty, if any, there is in complainant's patent No. 300,509, with special reference to the first claim thereof. Please also compare the device shown, described, and claimed in complainant's patent No. 300,509, having special reference to the first claim thereof, with the fastener which complainant's counsel has offered in evidence in this case and marked "glove with Kraetzer fastener," giving your reasons for any opinion which you may express.

Ans. Richardson patent No. 300,509 shows and describes a metallic fastener of the same general character as those shown and described in the various patents heretofore referred to by me—that is, it has a knob or button member attached to one flap of a garment and a socket or button-hole member attached to the other flap, which socket has a contracted elastic mouth through which the knob is forced in fastening and unfastening the garment. This fastener is said to be an improvement upon the one described in patentee's former patent, No. 276,714, dated May 1, 1883, and to consist espe-

No. 289.
B. & S. Fastener Co. } p. 60. a
v.
Kraetzer



Defendants Exhibit
Patent
Richardson 300508
Comparative diagram
A. E. L.
Spec'l Exr.

cially in the arrangement of the ball and socket member of
61 the fastening described in said patent, whereby the socket member of the fastening is made to cover the upper and side surfaces of the ball member and is made available for ornamentation and the strength of its holding arm or shank increased.

It appears to me permissible to assume when, as in this case, the invention described is an improvement on a formerly patented invention, that the invention or improvement must reside in the features that distinguish the improved device from the previous one upon which it is an improvement.

Referring, then, to the earlier patent, No. 276,714, it shows a fastener in which the socket or button-hole member and the knob of the button member are attached to their respective flaps by lateral arms, although one modification is shown in which the socket member is attached at its middle to the flap of the garment.

In patent 300,509, however, the socket member is in all cases attached by a lateral arm. In both patents the socket member is made from sheet metal, the socket being rounded up from a flat plate and the shank which extends laterally from the part thus rounded or bent up to make the socket is curved transversely or made channel-shaped to give it greater stiffness, and as the convex side of such a channel piece is of better appearance than the concave side, the fastener was applied to the fabric with the concave side of the shank downward toward the fabric, which was underneath the fastener. The socket was in that patent, No. 276,714, placed with the concave side up, so that the ball or button head dropped down into it in the act of fastening, and such concaving of the shank portion down and the socket portion up tended to make a weak point in the metal at the junction of the socket and shank portions. This objection was overcome by the construction shown in patent No. 300,509 by making the fastener with the socket turned downward, so as to shut down over the ball in the act of fastening, instead of having the ball drop down into it, as is the case with the fastener in patent No. 276,714.

In patent No. 300,509 is the following statement:

"The socket member b has been yielding sides b^1, and is like the socket member described in said patent (No. 276,714), with the exception that the shank b^2 is curved in a direction opposite to
62 that shown and described in said patent, and the upper portion b^3 thereof (*i. e.*, of the socket) provides means whereby an ornamental finish can be given the fastening. This shape of shank increases its strength, especially at its junction with the socket. Suitable ornamentation can be given the upper surface b^3 of the socket."

The curvature of the shank referred to must, I think, be the transverse curvature, as it is shown straight longitudinally, and the statement that it is curved in the opposite direction to that of the shank in the former patent must mean, I think, with relation to the socket member; in other words, the concavity both of the shank and the socket are on the same side, or downward, in patent No. 300,509, instead of being on the opposite side, or one up and one down, as in

patent No. 276,714. This gives the increased strength referred to at the junction with the socket, as I have already explained. In both of these patents the socket member of the fastening is practically a portion of a hollow sphere, about one-half of which is complete and unbroken, and from the upper edges of this hemisphere are extended two side wings, which curve toward one another and the ends of which form a contracted orifice through which the ball is forced in fastening and unfastening, and these side wings are sufficiently elastic to admit of such forcing through of the ball, which is of little larger diameter than the normal opening between the ends of the said wings when not strained or forced apart by the passage of the ball through them. This socket is, then, one continuous piece of sheet metal which encloses more than half of the ball and which when placed mouth downward, as described in patent No. 300,509, may be engraved or embossed or otherwise made ornamental on its outer surface.

On a comparison of these two patents, No. 300,509 and No. 276,714, alone, I am of the opinion that the only novelty in the parts referred to in the first claim of patent No. 300,509 consists in turning the socket member of patent 276,714 with its mouth downward, so as to shut down over the ball member and so that the outer surface of the socket member is exposed to view and conceals the ball when the two members are fastened together.

The first claim of patent No. 300,509 is: "In a fastening for gloves and other articles, a ball member thereof fastened to the
63 article on which it is used, substantially as described, with a socket member, also fastened to such article and having, when so fastened, its mouth towards the surface of the article, whereby it is adapted to be shut over the ball and cover or partly cover it, as specified, substantially as and for the purpose set forth."

The socket member referred to in this claim must, I think, be limited to one of the kind shown and described in the specification, namely, a hollow metal shell which partly encloses the ball member and which has arms projecting on one side of the shell, the extremities of which form a contracted opening through which the knob is forced, said arms being sufficiently elastic to permit of such forcing through of the knob member between their ends, and, in my opinion, it should be further limited to such a socket connected with the fabric by the integrally laterally projecting arm.

It states in the specification that the invention is not limited to the shape of the ball member and the sides of the socket, but there is no modification shown or described referring to the general shape or construction of the socket member and its attaching arm.

If it should be held that the term "socket member" meant any socket member of a button-hole or fastening so connected with the fabric or article as to shut down over and conceal or partly enclose the ball or button member, so that the socket member would be the part visible at the outside of the glove or garment when fastened, and, such socket member being made with an elastic mouth or opening through which the button head is to be forced in fastening or unfastening the garment, then the terms of the claim would in-

clude the button shown in the Mead patent, No. 227,440; the button shown in Schloss French patent, No. 95127, dated May 2, 1872; that shown in Schloss British patent, No. 1450 of 1870; the button shown in Bayer British patent, No. 809 of 1877, and the button shown in the Dowler British patent, No. 795 of 1883, and would be fully anticipated by the said earlier patents.

On comparing defendant's fastener with the fastener shown and described in the Richardson patent, No. 300,509, with special reference to such features of said Richardson fastener as are referred to in the first claim of that patent, I would first point out that the button-hole member or socket, if it should be so called, of de-
64 fendant's fastener is not attached to the garment by a laterally projecting arm and is therefore in this particular substantially different from the fastener shown and described in the Richardson patent; second, defendant's fastener, as I pointed out in my last answer, has no socket of the kind shown and described in the Richardson patent and nothing substantially resembling the same, except in the general feature of having a hollow member that receives the button or knob; in other words, in defendant's fastener there is no socket composed of a hollow shell of metal having a contracted mouth, the said shell being yielding around said mouth to permit a knob or ball slightly larger than the mouth to be forced into and out from the mouth. On the other hand, the contracted and elastic part through which the button head is forced in defendant's fastener is a simple ring split at one side and loosely contained in a hollow metallic shell that is attached to the fabric. This spring ring and chamber enclosing it are at the under side of the fabric and are attached by means of a dome or button head at the other side of the fabric, which is the part exposed to view when the garment is fastened, and the button-hole member, as a whole, has its mouth downward and shuts down over the button member, being so far like the Richardson socket, but being equally like the prior fasteners shown in the Mead patent, No. 227,440, and the Schloss English and French patents and other patents to which I have just referred in this answer.

I am therefore of the opinion that the Kraetzer fastener does not embody the invention shown and described in the Richardson patent, No. 300,509, and referred to in the first claim thereof.

Complainant's expert, Mr. Brown, as I understand him, in comparing the defendant's fastener with the one shown in the Richardson patent, No. 300,509, regards them as substantially the same because, as he says, both contain a socket with the mouth turned downward to co-operate with the ball or button member, which the said socket partly covers and encloses. In his diagram comparing these two devices he also points out that both have what he calls spring-yielding sides, and for this reason I suppose he construes the term "socket member" in claim 1 of the Richardson patent as meaning only a socket member having a spring of some kind and not merely a socket of any kind, either elastic or non-elastic in all parts.

65 I see no reasons why he should choose to construe into the claim this one particular limitation as to the socket member, namely, that it shall have spring-yielding sides, rather than to regard it either as a socket broadly without any limitation, except that its mouth is toward the fabric, or, on the other hand, to construe it as meaning the only socket shown and described in the patent, namely, one having spring sides, but having these spring sides an integral part of the complete metallic shell that encloses the button member when the garment is fastened. I notice that in Mr. Brown's comparative diagram he apparently regards the two halves of the spring ring as the equivalent for the spring sides of the Richardson socket, which is, in my opinion, wholly unwarrantable, for reasons that I have explained fully in my last answer.

He has also marked the part that contains the spring ring, or which I have called the spring chamber, as the socket. Now, if this spring chamber be the part of the Kraetzer fastener that corresponds to the Richardson socket it is different from the Richardson socket in the points clearly specified in the first claim of the Richardson patent No. 300,509.

The mouth of the spring chamber through which the knob or button head enters is turned away from the fabric and not towards it, and the entire spring chamber passes below the knob or head of the button in the act of fastening, so that, so far as the spring chamber is concerned, the knob or button head would not be covered or partly covered by the socket, which would merely surround the neck of the button below the button head.

The part that Mr. Brown has marked as the equivalent of the Richardson socket is not, therefore, "adapted to be shut over the ball and cover or partly cover it," like the Richardson socket, as specified in the first claim.

I have prepared a comparative diagram of the Richardson patent No. 300,509, similar to Mr. Brown's, but in addition to the Richardson and Kraetzer fasteners I have also shown the Schloss and Mead fasteners as examples of prior fasteners, in which there is a spring button-hole member with its mouth or opening at the under side of the fabric and which shuts down over the button member so

66 that said button-hole member, as a whole, either wholly or partly encloses the knob or ball of the button member and is in its arrangement as much like the socket of the Richardson patent No. 300,509 as is the Kraetzer button-hole member.

The modification of the Mead fastener is based on the following statement in the Mead specification:

"The cap *a* (*i. e.*, top of spring chamber) is perforated centrally to allow the stud to be pushed up far enough to engage the spring. In lieu of perforating the cap it may be raised centrally."

I am of the opinion, therefore, that any construction of the first claim of the Richardson patent No. 300,509 that would include the Kraetzer fastener or portions of such fastener as equivalents for the parts referred to in that claim would also necessarily include the Schloss and Mead and various other fasteners and would be fully anticipated by them; and, further than this, I am of the opinion that

No. 289.
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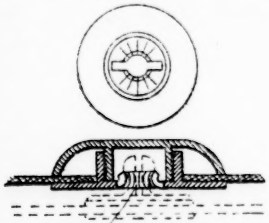
v.
Kraetzer

Schloss
British pat.
1450 of 1870



spring-sided socket
(shuts down over button)

Mead
227,440
May 1880

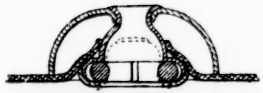
Modification

Button-hole member (ii socket)
with spring-clasp to engage
button-neck. Shuts down over button

Richardson
300,509
June 1884

button.

Kraetzer



Button-hole member (ii socket)
with spring ring.
Shuts down over button

Defendants Exhibit
Patent No
Richardson 300509
comparative diagram

A. E. L.
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the invention in the Richardson patent No. 300,509 is by its terms limited, so far as relates to the socket, to the slight differences between that socket or the button-hole member and the one shown in patent No. 276,714, which differences I have before pointed out at some extent, and the invention, if there be any at all in arranging the socket mouth downward, must consist merely in turning the specific socket of patent No. 276,714 mouth downward, or, in other words, in merely inverting the position of the socket relative to the shank in said patent No. 276,714.

(Counsel for defendant introduces in evidence the diagram referred to by the witness in his last answer, and the same is marked "Defendant's Exhibit Richardson Patent No. 300,509, Comparative Diagram.")

(Here follows diagram marked p. 66*a*.)

Int. 8. Will you please compare complainant's patent No. 300,510, heretofore referred to, and state what the device therein shown and described is, and compare the same with the devices and inventions referred to in the several patents in Ints. 3 and 4, setting forth what novelty, if any, there is in complainant's patent No. 300,510, with special reference to the first claim thereof? Please also compare the device shown, described, and claimed in complainant's patent No. 300,510, having special reference to the first claim thereof,
67 with the fastener which complainant's counsel has offered in evidence in this case and marked "glove with Kraetzer fastener," giving your reasons for any opinion you may express.

Ans. The Richardson patent No. 300,510 is also for a metallic fastener consisting of a button member and a button-hole member, and, so far as the part of the button-hole member that co-operates with the button member is concerned, it is precisely the same as the socket or button-hole member in Richardson patent No. 300,508, from which it differs only in the means for attaching it to the fabric. Like the device shown in patent No. 300,508, it is described as an improvement on patentee's earliest patent, No. 260,050, dated June 27, 1882, and the patentee states in one place that the socket of patent No. 300,510 differs from the member described in his various letters patent in that it has an open socket; in other words, in Richardson's earlier patents, No. 260,050 and No. 276,714, there is a socket which forms a more or less complete shell that encloses the button, said shell having converging side wings, the ends of which form an opening through which the button is inserted into and removed from the shell or socket, and the sockets of 300,508 and 300,510 are practically the same thing with the back of the shell removed, leaving only the curved converging spring arms and the circumferential ring that supports them, so that they form a contracted mouth or opening through which the ball member is introduced. As I have just stated, the socket member of patent No. 200,510 when attached to the garment is substantially the same as that of patent No. 300,508, and the only novelty in such socket member of patent No. 300,510

is substantially the same as I have pointed out in considering patent No. 300,508, or, to repeat briefly, the only novelty consists in a socket having elastic or yielding converging spring arms, the bases of which connect with a ring which is attached to the fabric.

If patent No. 300,510 shows any invention whatsoever relating to a socket member other than what is shown in patent No. 300,508 it consists solely in the device for attaching the device to the fabric. The socket of patent No. 300,510 is the same as the one shown in Fig. 11 of patent No. 300,508, except that instead of having the two walls of the flange folded close upon one another and having the attaching tube extend directly from said flange in the same piece of metal, the two sides of the folded flange in patent No. 300,510
68 are left with a small space between them and there is no connected attaching tube before the socket is applied to the fabric. The attaching device of patent No. 300,510 is, however, a separate piece or eyelet, the tubular neck of which is inserted through a hole in the fabric and is then upset into the annular space between the folds of the flange of the socket ring, thus fastening the socket and eyelet together and clamping the fabric between the flange of the eyelet and the folded flange of the socket. In this manner the two flanges that are to embrace the fabric are made in the two separate parts before they are put together, and the flange which is upset in the act of attaching and is likely to be split or become ragged in such upsetting operation is concealed within the folded flange of the socket member, so that there is more certainty of obtaining a smooth and neat finish in the attached fastener than with the construction shown in patent No. 300,508.

The first claim of patent No. 300,510 is:

"The member of a fastener for gloves and other articles consisting of a section having the flange a^5, yielding sides a^2, and the eyelet b^1 having the flange b^2, the end section b turned within the recess formed by the flange a^5, all substantially as and for the purposes described."

This claim appears to be very specific in its terms and, as I understand it, refers to the button-hole member of the fastener composed of two parts or pieces, and the section or part referred to as having the flange a^5 and yielding sides a^2 must, I think, refer to a single piece having a folded flange and converging spring sides or arms, the bases of which are in one piece with or at least rigidly connected with said flange, and the other part is an eyelet having a flange at one end and having its other end turned out into the recess in the flange of the first section—that is, between the folds of said *annual* folded flange.

I am unable to see anything in the parts referred to in this claim that correspond in function or mode of operation to the parts of defendant's fastener, which does not contain two sections having the parts specifically enumerated in the first claim of the Richardson patent or anything resembling the construction or mode of
69 operation of the parts shown and described in the Richardson patent that are referred to in the first claim.

On looking at the diagram in which complainant's expert com-

pares the Kraetzer fastener with the one shown in the Richardson patent, No. 300,510, it appears that he again regards the Kraetzer spring ring as the equivalent of the spring yielding sides of the Richardson socket, which, as I have pointed out in considering patent No. 300,508, seems to me a wholly unwarrantable assumption, and he takes one side of the spring chamber as the equivalent for the Richardson eyelet and points out parts at the ends of that side of the spring chamber which he thinks correspond to the flanges at the ends of the Richardson eyelet. This appears to me to be a very strained comparison, and the similarities can only be detected by a total disregard of the mode of operation of the two devices.

The two sections or parts referred to in the first claim of the Richardson patent are applied, one at one side and the other at the other side of the fabric, and the whole device is attached to the fabric by the interlocking of these two parts when so applied. The two parts of the Kraetzer fastener, however, that Mr. Brown thinks correspond to these two parts of the Richardson fastener are put together before the device is attached to the fabric, and the act of attaching to the fabric in no way depends on the interlocking of these parts, but the Kraetzer device is attached by the interlocking of these connected parts with still another part at the other side of the fabric. Even assuming that the dome button head of the Kraetzer fastener is merely an extension of the neck of the spring chamber, as Mr. Brown asserts, it seems to me wholly absurd to regard such dome fastening and the adjacent side of the spring chamber as the equivalent for the Richardson eyelet with its flange b^2, as it would be wholly impractical to attach the Kraetzer fastener to the fabric by inserting the upper half of the spring chamber already attached to the dome button head through the fabric from above and then interlocking it with the under half of the spring chamber.

It seems to me absurd to regard the flanged plate forming the lower side of the spring chamber and the loose spring wire resting upon it as the equivalent for the parts of the Richardson fastener referred to in the first claim as "a section having the flange a^5 (and) yielding sides a^6." The Mead patent, No. 227,440, shows the stud or button member attached to the fabric by a method quite similar to that by which the Richardson socket member is attached—that is, it differs from the more common method of setting eyelets by flaring out the end of the tube on one side of the fabric in that the attaching eyelet "G" in the Mead patent has its ends flared out or upset within a flange already formed on another part of the piece to be attached.

While I am unable to see that there is any substantial likeness between the parts of the Kraetzer fastener and the fastener of the Richardson patent, No. 300,510, that are marked with the corresponding letters on the Brown drawing, I have prepared another diagram showing also the fastener of the Schloss British patent, No. 1450 of 1870, which I think approaches far more nearly in construction and mode of operation the Richardson fastener than does the Kraetzer fastener. My reason for this opinion is that the Schloss fastener, like the Richardson, is made in two sections, parts, or

pieces, one section having a socket with spring-yielding sides and a flange and the other having a flange and a tubular neck, and this fastener is attached to the garment by applying one of said pieces at one side and the other at the other side and interlocking them. They are shown, however, as interlocked by a screw-thread, and the flange of the section that has the spring sides has no recess to receive the end of the tubular neck of the section at the other side of the fabric.

The specific construction of the Richardson fastener in two pieces, one consisting of a piece having the spring sides and the recessed flange and the other piece being an eyelet, the end of which is upset into the recess of the flange in the act of attaching the whole device, is, so far as I know, novel with Richardson; but these features do not exist at all in the Kraetzer fastening, which has no parts equivalent to these in construction and mode of operation.

(Counsel for defendant introduces in evidence the diagram referred to in the last answer, and the same is marked "Defendant's Exhibit Comparative Diagram Richardson No. 300,509.")

(Here follows diagram marked p. 70*a*.)

71 Int. 9. Will you please examine complainant's patent No. 325,688, heretofore referred to, and state what the device therein shown and described is and compare the same with the devices and inventions referred to in the several patents mentioned in Int. No. 4, setting forth what novelty, if any, there is in complainant's patent No. 325,688, with special reference to the fourth, sixth, and seventh claims?

Ans. The Mead patent, No. 325,688, shows and describes a metallic fastener having a spherical button member attached to one flap and a button-hole member attached to the other flap, and having a contracted mouth through which the button head is forced in fastening and unfastening the garment, being in these general features like nearly all of the fastenings which I have previously referred to in this case. The fourth, sixth, and seventh claims refer to a button-hole member which has a socket consisting of a substantially spherical shell with a considerable portion of the sphere removed, so as to leave two projecting converging spring arms or wings, the ends of which form a contracted mouth, through which the ball member passes. This socket member is very much like the socket member of the Richardson patent No. 276,714 and patent No. 300,509, except in the manner of its attachment to the fabric, and it is probable that the sockets shown in the said Richardson patents are the ones referred to in the Mead specification in speaking of the socket of the Mead button, which is called a "hollow socket provided with yielding sides."

Then follows in the Mead specification the statement:

"This form of socket has heretofore been secured to the upper side of the fabric by a lateral arm, which does not present a neat or ornamental finish and is liable to catch and be torn from the article.

No. 289.

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v.
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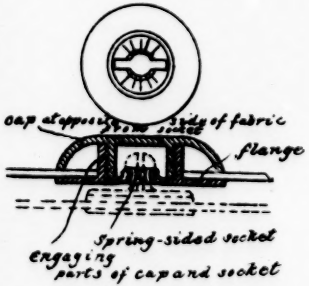
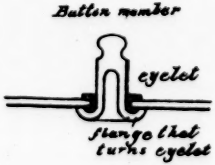
} p. 70 a

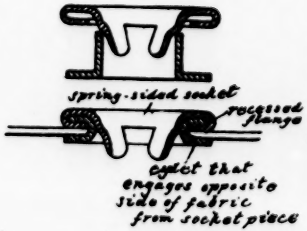
Schloss
British Pat 1450 of 1170



Mead,
227440
May 1880



Richardson
300510 June 1884



Kraetzer

Defendants Exhibit
Richardson 300510
Comparative diagram
A. E. L.
Spec'l Ex'r.

Hence I propose to radically change the position thereof and employ the active or socket portion below the fabric and dispose an ordinary fastening eyelet 1 through said socket D."

This, I think, clearly indicates that the socket of the Mead patent is a hollow shell provided with yielding sides and is substantially like those of earlier fasteners—for example, those in the Richardson patents referred to—except in the manner of attaching it to the garment. This attachment of the socket of the Mead fastener is effected by providing the socket at a point opposite its open mouth,
72 through which the ball enters, with a hole which receives a fastening eyelet that passes through the hole in the fabric and engages with a disk at the other side of the fabric from the socket. This disk is shown as dome-shaped and is described as preferably so shaped, and in one form illustrated in the Mead patent it constitutes the cap or part of the button that is visible at the outside of the fabric. In the construction that is described first, however, this disk is covered by an imperforate cap, which is called the button head and which is applied to the disk that engages the eyelet, so that the flange of the eyelet rests between the disk and the button head. The whole contrivance is then attached to the fabric by placing the button head and enclosed disk above the fabric, with the tubular neck of the eyelet extending down through a hole in the fabric and into a hole in the socket, after which the end of the eyelet is upset in a hole in the socket, and this fastens the socket or button head and enclosed disk together and attaches the whole to the fabric.

(Adjourned.)

Nov. 30, 1888.

(Witness continues:)

The fourth claim of the Mead patent, No. 325,688, is: "In a fastening device of the nature described, the enclosing portion, composed of a hollow socket centrally secured to the fabric by a button head, F, and with the enclosing portion disposed upon the under side of the flap, substantially as stated." This claim mentions definitely a "hollow socket" and a "button head, F," and points out that the socket is "centrally secured," and is "disposed on the under side of the flap," these being the only elements definitely pointed out in the claim and the only limitation as to such elements. The button head F referred to in this claim is an imperforate cap that encloses the disk described in the patent, with which the fastening eyelet is interlocked. I think that the claim also involves by implication a cap and fastening eyelet or some other means which may be regarded as the equivalent of such cap and eyelet, so far, at least, of performing the function of fastening the button head and socket together with the fabric interposed between them, so that the said connected button head and socket are attached to the fabric.

I am of the opinion that the term "enclosing portion composed of a hollow socket" must mean a spherical shell or socket of

73 such shape as to nearly enclose and surround the button head, having converging spring wings or arms through which the button head is inserted and which by their elasticity clasp around the under part of the button head or part nearest its shank.

The Mead button head is very nearly spherical in shape and, strictly speaking, has no shank, but the ends of the spring arms must pass below the middle circumference or the largest diameter of said button head, so as to hold said button head enclosed in the socket. The term "centrally secured" seems to me to mean that the said socket is secured by a fastening which passes through the middle of the complete or unbroken hemisphere of the socket, or it may mean only that the said socket is concentric with the part of fabric engaged between the socket and button head in attaching the member to the fabric. My reason for thinking that the term "socket" is limited to such a substantially spherical shell, or at least a shell which nearly surrounds and encloses the button head, is that such form of socket is shown and described in the specification and no modification of the socket is shown or suggested, and the specification as a whole indicates clearly, to my mind, that the invention does not consist in any new form of socket, but only in the manner of attaching an old form—for example, that of Richardson patent, No. 300,509—namely, by attaching it at the middle instead of at the end of the arm projecting laterally from the shell or socket. If, however, the term socket means any "socket" whatsoever having a contracted elastic mouth through which the button head is inserted, and the term "centrally secured" means any manner of fastening by which such socket is attached with its mouth concentric to the part engaged with the fabric in attaching the member, and the only limitation is that it is attached with the socket upon the under side of the garment, then the parts referred to in the claim would be full equivalents of the corresponding parts of the fastener shown in the Schloss English patent, No. 1450 of 1870, which has a socket with spring sides or, in other words, a contracted elastic mouth disposed at the under side of the flap and centrally secured by the button head at the other side of the flap. In the Schloss patent the socket is fastened directly to the button head by interlocking

74 the tubular portion on each, thus differing from the Mead eyelet and disk enclosed within the button head, but this difference is, I think, immaterial, as the means for connecting the socket and button head are not referred to at all in the fourth claim of the Mead patent.

The British patent to Bayer, No. 809 of 1877, also shows a socket or member having a contracting mouth or opening, which is made elastic or yielding so as to permit the passage of the button head and then close around below the largest part of the button head, and which is secured to the fabric by a cap or button head at the other side of the fabric, with the said socket portion disposed on the under side of the fabric, and it is "centrally secured," if that term means a fastener, with the mouth of the socket concentric with the portion of the fabric engaged between it and the button head at the

other side of the fabric—that is, the Bayer fastener has a button-hole member composed of an enclosing cap or button head at the upper or exposed side of the fabric and a socket with a contracted resilient mouth at the under side of the fabric, all the operative parts being practically concentric.

Dowler British patent, No. 795 of 1883, shows a fastener, the button-hole member of which closely resembles, in all important features of construction and operation, the fastener shown and described in the Mead patent, No. 325,688.

It has an enclosing portion or hollow socket consisting of a metal shank shaped to nearly surround and enclose the button head and having the part towards the open mouth formed in two converging spring arms, which yield to permit the button to enter and then contract around the button below its largest circumference. The said socket of the Dowler patent is provided with a central hole opposite its open mouth and when attached is disposed at the under side of the fabric to which it is secured by being interlocked with a dome-shaped cap or disk at the upper side of the fabric, which engages said socket at its central opening. The Dowler fastening dispenses with the imperforate button head F of the Mead patent, the dome-shaped disk, to which the socket is attached, forming the button head or finish that is visible at the upper side of the fabric; and, so far as this feature of construction is concerned, the Dowler button is identical with the modification of the Mead button shown in Fig. 12 of the Mead patent in consideration, from which it differs only in the two following particulars:

First. Mead employs a separate eyelet to pass through the hole in the fabric and connect together the disk above the fabric and the socket below the fabric by flanges at both ends of said eyelet, while in the Dowler fastener a separate eyelet is not employed, but the cap has a tubular neck that engages the socket member.

The next difference is that in the Mead fastener the fabric is clamped or pinched between the back of the spherical socket and the inner or concave portion of the dome-shaped disk at the other side of the fabric, while the Dowler fastener has outer projections at the ends of the spring sides of the socket, between which projections and the outer edges of the cap at the other side of the fabric the fabric is pinched or held. In one modification of the Dowler fastener these flanges alone are depended upon to engage the under side of the fabric and thus make a ring which is broken at two points, namely, at the recesses, which are made so as to provide the separate spring arms or wings for the under half of the socket; but in the form described first the broken flange is covered by a channel-shaped ring, which thus makes a complete annulus to engage the fabric without interfering with the spring action of the wings of the socket. Another minor difference that I notice is that in the Mead fastener the fabric extends clear to the eyelet and is stretched up into the space between the dome-shaped back of the socket and the under side of the connecting disk, while in the drawings of the Dowler patent the fabric is shown as having an opening substantially as large as the largest diameter of the socket, and the back of

the socket is brought up into contact with the under side of the disk to which it is attached. This difference seems to me trivial and immaterial, and probably does not exist in actual fact to the extent indicated by the drawings, which are to a certain extent conventional in the representation of the engagement of the fabric, owing to the great enlargement necessary to indicate clearly the construction. The fasteners are made of comparatively thin sheet metal, and the fabric or material to which said fasteners are applied varies largely in thickness and compactness of structure, and it is probably the fact that in the actual application of the Mead fastener
76 the cap and back of the socket come relatively closer around the eyelet than shown in the Mead drawings; and, on the other hand, I think it equally probable that in attaching the Dowler fasteners to the material the edges of the material will be turned up more or less into the space between the back or outer surfaces of the socket and the inner surfaces of the disk at the other side of the fabric, so as to be clamped to a certain extent between these parts, as well as between the outer edges of the parts, as shown in the drawings. This feature, at any rate, would be largely accidental or an incident to the act of upsetting the edges of the tube of the eyelet of the Mead fastener or neck of the disk of the Dowler fastener, depending on the nature of the fabric and somewhat on the thickness and malleability or ductility of the metal of which the fastener is composed and on the pressure of the tools used in fastening the parts together. By the term "fabric" I of course mean the material of the garment or article to which the fastener is attached and which is generally of skin or leather of some kind, although, of course, such fasteners may be applied to cloth.

In view of the Dowler patent, the novelty of the enclosing portion or hollow socket of the Mead fastener, even when distinguished from the Richardson sockets by being "centrally secured," would have to be limited to such a centrally secured metallic shell, which actually terminates at the ends of the spring arms, so that the back or convex side has to be employed to engage the fabric; and in view of the Bayer and Schloss patents, to which I have just referred, showing that an imperforate button head or cap at the upper side of the fabric secured to an elastic socket of some kind at the under side was not new with Mead, the only novelty in the parts referred to in the fourth claim of the Mead patent, so far as I can see, must reside in a fastener having the exact form of socket last specified by me—that is, a hollow shell with spring arms co-verging and actually terminating in a contracted or expansible mouth, and such socket being connected with an imperforate button head at the other side of the fabric.

The sixth claim is "A member of a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it is centrally attached to the fabric, substantially as set forth." This claim mentions substantially the same elements
77 as the fourth, which I have just discussed, and also a rivet (*i. e.*, the eyelet) by which the socket and button head are connected; and, furthermore, it is not stated in the claim that the

socket is disposed upon the under side of the fabric, although I think there can be no question but that such arrangement only is meant, as there is no other arrangement that could be effected by the three elements mentioned, except that of having the socket at one side and the button head at the other side of the fabric.

The omission of the words "disposed at the under side" may be intended to show that the inventor recognized that the fastener might be used with the mouth of the socket projecting up from the under flap of the garment, which would necessitate that the button should be attached with its head projecting down from the under side of the upper flap. This is, of course, equally true of all fasteners referred to by me, any of which would be in the relation last referred to if the glove or other garment were merely put on wrong side out. I am of the opinion that the socket and button head referred to in the sixth claim must mean exactly the same parts referred to in the fourth claim and are subject to the same limitations as I have already pointed out in discussing the elements referred to in the fourth claim, and the only novelty in the elements of the sixth claim, further than the specific novelty of the socket which I last mentioned, consists in using an independent eyelet or rivet to fasten together the socket and button head instead of using the part of the cap at the other side of the fabric for that purpose, as is shown in the Dowler fastener. It is possible that the term "button head" of the sixth claim might refer to the disk E of the Mead patent, as this is the part directly connected with the rivet or eyelet, instead of the imperforate button head specifically pointed out by reference letter in the fourth claim. If this is the case, such a button head is substantially identical with the button head or cap of Dowler fastener at the upper side of the fabric, and the only novelty of the parts mentioned in the sixth claim of the Mead patent is in the specific construction of the socket, before pointed out, and making the eyelet in a separate piece of metal from both socket and button head.

The seventh claim of the Mead patent is:

78 "A member of a fastening device composed of a hollow socket, D, centrally attached by an eyelet, *l*, the latter resting upon and within an annular depression, *q*, formed in a concaved collet or disk, E, substantially for purposes herein set forth." This claim mentions the hollow socket, the eyelet, and the concave collet or disk E, and states that the eyelet rests upon and within an annular depression formed in the collet or disk. This claim apparently specifically refers to the parts shown in Fig. 12 of the Mead patent, in which the disk to which the eyelet is attached is not enclosed in an imperforate button head, but itself forms the cap or finish at the upper side of the fabric. The socket D referred to in the seventh claim must, I think, mean a socket having all the limitations which I have before pointed out in discussing the fourth claim. The disk E mentioned in the seventh claim is substantially the same in its relation to the fabric and socket and in its functions in the fastener as a whole as the cap of the Dowler fastener, from which the Mead fastener, composed of the parts referred to in the

seventh claim, differs only in the slight differences pointed out, in the socket piece and in the fact that an independent eyelet is used to connect the socket piece and cap, and, further, that this cap is recessed—that is, has an "annular depression, *q*," to receive the flange of such independent eyelet. The annular depression referred to is simply for the purpose of making the end of the eyelet come flush with the outer surfaces of the disk, so as to give a good finish, and to make such a depression or recess to receive a portion of one piece, where two pieces are to be fastened together with an even finish, is a perfectly common expedient in all branches of mechanical construction. The recessing of the cap E to receive the end of the eyelet certainly does not in any way affect the mode of operation of the fastener, nor have any function in connection with the parts referred to in the seventh claim of the Mead patent other than what such rabbiting or recessing has in any mechanical structure. Substantially the same recessing is referred to in the Schloss British patent, in which the following statement is made with relation to the washer with which the tubular neck of the eyelet or rivet portion of the button member is interlocked in the act of attaching the said member to the garment:

"This opening *g* is bevelled or cut away in order to present
79 a cut-away portion, in which is forced the metal end of the tube *e* upon the washer *f*, as seen in Fig. 8, which shows a diametrical section of the button finished and fixed in place upon the leather, cloth, etc."

I quote from the translation, which is an exhibit in this case. The purpose of such bevelling in the Schloss fastener is undoubtedly to make the end of the tubular neck or rivet come flush with the washer, which is exactly the purpose of recessing the disk or washer E of the Mead fastener, the only difference, if there be any, being that in the Mead fastener it is to present a smooth finish to the eye, while in the Schloss fastener it is to present a smooth finish to the wearer, as the junction between the tubular neck and the washer is not usually exposed to view.

The drawings in the Mead patent show the recessing made by actually reducing the thickness of the metal, which is substantially the construction in the Schloss fastener to which I have just referred. Substantially the same result is, however, produced in thin sheet metal by merely depressing bodily the annulus of metal which is engaged by the end of a fastening rivet or eyelet and the flush finish in which the thin sheet metal is thus depressed, as shown, for example, in United States patent to Whitby, No. 241,767, dated May 17, 1881, in which the flanged part of the neck H, or the neck D, is brought down to a flush surface with the corresponding washers K and E by recessing the said washers. This, however, I should say is, in my judgment, an incident of construction, and is likely to occur at any time when pieces of thin sheet metal are interlocked or fastened together by upsetting one against the other by dies, as is usually done in attaching fasteners of this kind to garments.

It may possibly be novel with Mead to purposely make a depression around the opening of the cap E to receive the flange of the

eyelet before such parts have been acted upon by the dies that attach the fastener to the fabric; but such novelty, if it exists, is, in my judgment, nothing more than a perfectly well-known mechanical expedient, and I am therefore of the opinion that there is nothing novel in the parts referred to in the seventh claim of the Mead patent, further than the specific construction of the socket D to which I referred more fully in considering the fourth claim, namely, that it
80 is a hollow metallic shell having one side substantially unbroken or hemispherical in shape and with the central opening that receives the attaching eyelet or rivet, and its other side formed in spring arms or wings continuous with the unbroken side and converging towards one another to form at their actual extremities a contracted mouth, through which the button head is forced and which closes together below the part of the button head of the greatest diameter, so as to keep it in the socket until again forcibly pulled out through said mouth; and I am also of the opinion that unless the parts referred to in the seventh claim be restricted to the features which I have just pointed out, such claim would include the fasteners of the Schloss English patent, of the Bayer and the Dowler English patents, unless possibly the fact that the eyelet *l* of the Mead fastener is a separate piece from the cap and socket connected by it be regarded as a matter of substantial novelty.

Int. 10. Will you please compare the device shown, described, and claimed in complainant's patent No. 325,688, having special reference to the fourth, sixth, and seventh claims thereof, with the fastener which complainant's counsel has offered in evidence in this case and marked "glove with Kraetzer fastener," giving your reasons for any opinion which you may express.

Ans. Defendant's fastener, as I have before pointed out, has a button-hole member having the part that co-operates with the button head at the under side of the fabric or flap and attached to the fabric by being fastened to a dome-shaped cap at the other or upper side of the fabric. The part that forms the contracted mouth through which the button head is forced, and which closes in below the largest part of the button head, consists in the Kraetzer fastener, as I have before stated, of a wire ring split at one side to give it the power of expanding circumferentially for the passage of the button head, and such ring is connected to the fabric by being loosely contained in the spring chamber, the upper half of which has a tubular neck that is passed through a hole in the fabric and interlocked with the dome-shaped cap at the other side of the fabric.

The part below the fabric, comprising the spring chamber and spring ring held therein, corresponds in function to the socket of the Mead fastener, and like that socket is centrally secured to the fabric
81 by being interlocked with the cap or disk at the other side of the fabric, but in these particulars the Kraetzer fastener is no more like the Mead fastener than are the button-hole members of the Schloss, Bayer, and Dowler English patents referred to by me in my last answer. As I stated in my last answer, the fourth claim of the Mead patent mentions as the elements of which the

fastener referred to in the claim is composed only the hollow socket placed at the under side of the flap and the button head F, by which the said socket is centrally secured to the fabric. If these parts refer only to the socket and the button head shown in the drawing and described in the specification of the Mead patent, then the most nearly corresponding parts of the Kraetzer fastener differ substantially from these parts, as a spring ring loosely contained in a spring chamber composed of two pieces of comparatively ductile sheet metal is a substantially different device from the Mead socket, consisting of a hollow shell of metal having converging spring arms made as an integral part of that shell. If, however, the term "hollow socket" of the fourth claim refers to any hollow socket whatsoever capable of co-operating with a knob or button as a part of a metallic fastener, then the said claim would be broad enough to include equally the fasteners of the Schloss, Bayer, and Dowler English patents and would be fully anticipated thereby.

If the term "button head F" of the fourth claim refers only to an imperforate cap at the upper side of the fabric to which the socket is centrally secured in some manner, then the Kraetzer fastener does not embody this element of the fourth claim of the Mead patent, as the Kraetzer fastener does not have an imperforate cap or shell covering the dome-shaped disk to which the socket is connected. Unless this fourth claim of the Mead patent be limited so as to refer only to a fastener containing either an imperforate cap or a socket composed of a metallic shell having integral sides, or to one containing both these features (neither of which exist in the Kraetzer fastener), it would include the fasteners of the Schloss, Bayer, and Dowler English patents and would be anticipated thereby, the said Dowler patent being, both in construction and mode of operation, far more nearly like the Mead fastener than is the Kraetzer fastener.

The same comparison holds true of the sixth claim of the
82 Mead patent, which refers to exactly the same elements as the fourth, except that it also includes the rivet or eyelet by which the socket and button head are fastened together and the whole device attached to the fabric. If the rivet referred to in this claim is an independent rivet or one made in a separate piece from the socket and button head that are connected by it, then it does not exist in the Kraetzer fastener, in which there is no rivet separate from the spring chamber which with its enclosed spring corresponds most nearly to the Mead socket, and which is attached to the garment by the interlocking of a portion of the spring chamber itself with the dome-shaped disk at the other side of the fabric. If, on the other hand, the term "rivet" in the sixth claim of the Mead patent is held to mean any part, tubular or otherwise, that is capable of being upset or headed so as to interlock the socket below the fabric with the disc above the fabric, then it would also include the attaching part of the Dowler fastener, and possibly also the attaching prongs of the Bayer fastener, and even if limited to a central tubular neck, it would be substantially the same as that of the Dowler fastener, which is certainly as much like the Mead fastener

in respect to the means for fastening the two parts together as is Kraetzer's. In the Dowler fastener the cap has a central tubular neck which passes down through a hole in the garment and is spread out into the hole in the socket, while in the Kraetzer fastener the spring chamber has a central tubular neck which passes up through a hole in the fabric and is spread out into a hole in the disk or cap, and in the Mead fastener neither the cap nor the socket has a neck made integrally with it, but the cap has a flanged eyelet connected with it, which, like the neck of the Dowler cap, is passed downward through an opening in the fabric and engages with the central opening in the socket. I am therefore of the opinion that any construction of the sixth claim of the Mead patent that would include the Kraetzer fastener would also include the Dowler fastener and be anticipated thereby, and, further than this, that there is no one feature or collection of features in these parts of the Mead fastener referred to in the sixth claim that distinguish it from the fasteners of the Schloss, Bayer, and Dowler English patents that exist in the Kraetzer fastener.

83 The seventh claim, as I have pointed out in my last answer, differs only from the fourth and sixth in that it specifies the eyelet by a reference letter, *l*, and also specifies that it rests in the annular depression *q* in the collet or disk E, which latter is definitely referred to in the sixth claim as the part to which the socket is fastened instead of the imperforate button head, which is referred to definitely in the fourth claim, and is probably the part meant by the term "button head" in the sixth claim, as it is the only part called by that name in the specification.

I am of the opinion, therefore, that unless the hollow socket D referred to in the seventh claim means the special form of socket shown and described in the Mead patent, there is no feature of substantial novelty in the seventh claim, and such form of socket does not exist in the Kraetzer fastener. If the term "eyelet" of the seventh claim means an ordinary eyelet, independent of or a separate piece from the parts connected by it, then no such eyelet exists in the Kraetzer fastener. If it should be held, however, that the seventh claim means a hollow socket of any kind attached to a cap of any kind by upsetting the end of a tubular rivet of any kind into a depression formed in the cap, then the only novelty in such claim would consist in making an ordinary rabbit or depression at the junction of the rivet and cap, which, as I have before pointed out, is a common mechanical expedient and is illustrated in fasteners of this kind, although not shown in exactly the same position in such fasteners; but it is perfectly obvious that this expedient of construction performs no different function in the Mead fastener from what it does at any similar junction between the two metallic parts of any fastener, and does not in the least affect the mode of operation of the other parts referred to in the seventh claim. I have before pointed out that the Mead fastener shows the depression as made by actually reducing the thickness of the metal, and there is no such reduction of the thickness in the metal of the cap or disk of the Kraetzer fastener. I have, however, samples of the fasteners which

I am informed are made under the Mead patent, in which the cap or disk to which the socket is connected by an eyelet is made of thin sheet metal and has a wide annular depression around its central opening which receives the flanged end of the eyelet. This
84 depression is made by sinking the metal bodily rather than by materially reducing its thickness, the corresponding shape appearing at the inside as well as on the outside of the cap. I have also several samples of the Kraetzer fasteners, and especially of the cap portion thereof, which show that no such depression or countersink is made around the central opening in the cap.

There is a slight depression or curling in of the metal, however, in some of these Kraetzer caps, which is more pronounced in some than in others, indicating that whatever depression there may be is a mere accident, resulting from the action of the dies that cut the central opening, and that it is not an annular depression made for any specific purpose in said caps, for if it were it would have to exist equally in all. Further than this, in most of the attached fasteners of the Kraetzer kind the end of the neck is about flush with the convex side of the cap; but this again appears to be merely accidental, or an incident, so to speak, to the act of interlocking the parts or clinching the neck upon the cap or washer, and is thus just the same constructively as the rabbeting or recessing shown in the United States letters patent to Whitby, No. 241,767, to which I referred in my last answer. The result, therefore, if it be a matter worthy any consideration, of obtaining a substantially smooth finish at the top of the button is attained in the Kraetzer device in a substantially different manner from that by which it is obtained in the Mead fastener, namely, in the Kraetzer device it is attained by forcing the neck of the spring chamber down below the surface of the button head or disk in the act of upsetting and clinching said neck, while in the Mead device it is attained by making in the cap or disk, by its original shaping dies, a depression that receives the originally formed flange of the eyelet, and in the Dowler fastener the same result is attained by making the neck integral with the cap and clinching it inside the socket as the neck of the eyelet in the Mead fastener is clinched in attaching the fastener to the fabric. I am therefore of the opinion that there is no feature of substantial novelty in the parts of the Mead fastener pointed out in the seventh claim that is embodied in the Kraetzer fastener, and that any construction of that claim that would include the Kraetzer fastener would also include the Dowler fastener and would be anticipated thereby.

85 In the comparative diagram prepared by complainant's expert, Mr. Brown, it appears that he regards the entire spring chamber and spring ring of the Kraetzer fastener as the substantial equivalent of the Mead socket, and the neck of the spring chamber as the equivalent of the Mead eyelet, and the depression formed by upsetting the neck of the spring chamber against the button head or dome washer of the Kraetzer fastener as the equivalent of the recess that receives the flange of the eyelet in the Mead fastener. In this drawing Mr. Brown has marked the spring ring and the portion of the spring chamber above the spring ring as the socket,

while in comparing the same device with the Richardson patents, Nos. 300,508 and 300,509, he marked the annular space that acts to confine the spring as the socket. I think, however, there is no warrant for regarding the spring chamber and ring, or, in other words, the parts of the Kraetzer fastener below the fabric, as the equivalent for the socket referred to in the claims of the Mead patent for reasons before pointed out by me, namely, that there is nothing in the Mead specification that indicates that any other socket than the particular one specified and shown in the drawings is meant; and, further, that if any socket having a spring-sided opening to co-operate with a button or stud is meant, then the Mead invention would be fully anticipated by the prior contrivances.

I have prepared a similar comparative diagram showing the Dowler fastener in addition to the Mead and Kraetzer fasteners, and it seems to me perfectly apparent that there is nothing that distinguishes the Mead fastener from the Dowler fastener, or, in other words, no advance or improvement over Dowler made by Mead that is adopted in the Kraetzer fastener. I have before spoken of the fact that the manner of engaging the fabric is shown as somewhat different in the Dowler and Mead patents, the fabric being represented as perfectly flat and terminating at the base of the socket portion in the Dowler patent, while in the Mead patent it rounds up over the convex back of the socket piece; but this difference, as I have before pointed out, is, I believe, rather accidental or an incident to the act of attachment, and the differences that appear in the drawings are largely due to the difficulty of representing accurately on a large scale the actual relations of such minute devices and parts.

86 In the drawings of the Kraetzer device of my sketch the fabric is probably represented as somewhat thinner in proportion to the fastener than it would usually be, although I think that in many cases it would be in very nearly the proportion there shown. The fabric in the Kraetzer fasteners rounds up over the part above the spring ring that surrounds the head of the button after in has been forced up through the spring ring, and, as I have before stated, I have no doubt that when the Dowler fastener is attached to the fabric it rounds up over the spring socket in a similar manner. This particular disposition of the fabric does not seem to me to be of any consequence in considering the Mead fasteners, as nothing is said in the Mead patent that indicates that the Mead invention depended in any way upon the manner in which the fabric was engaged or clamped. So far, however, as the relation of the fastener as a whole to the fabric is concerned—that is, the socket being placed mouth downward underneath the fabric and attached thereto by the convex disk or cap above the fabric, and so that the part of the neck of the button embraced by the spring is near the plane of the fabric—the Dowler, Mead, and Kraetzer fasteners are substantially alike, the relation of the Dowler socket to the fabric being rather nearer like the corresponding relation in the Mead fastener than in the Kraetzer fastener, as in both the Dowler and the Mead fasteners the mouth through which the button head must enter is rather lower down than in the Kraetzer fastener, in which

the cap is carried so far down that the smallest diameter of the spring ring, which really constitutes the contracted mouth, is almost exactly in or possibly a trifle above the middle plane of the fabric.

(Adjourned.)

BOSTON, *Dec.* 1, 1888.

(Counsel for defendant offers in evidence the samples of the fasteners referred to in the last answer by Mr. Livermore as samples of the Kraetzer fastener, of the Mead fastener, and the same are marked "Defendant's Exhibit Kraetzer Fastener" and "Defendant's Exhibit Mead Fastener, A. E. L., sp'l ex'r."

Counsel for defendant also offers in evidence the diagram referred to by Mr. Livermore in his last answer, and the same is
87 marked "Defendant's Exhibit Mead Patent No. 325,688, Comparative Diagram.")

(Here follows diagram marked p. 87*a*.)

Int. 11. Will you please examine the exhibit which I now hand you and state what it is?

Ans. The exhibit contains two fasteners attached to pieces of leather, the button-hole member of one of which fasteners is substantially the same as the fastener shown in Fig. 3 of the Dowler British patent, No. 795 of 1883, and the button-hole member of the other attached fastener is substantially the same as the one shown in Fig. 3 of the Dowler patent, except that the strengthening ring marked "b^3" in that figure is dispensed with and the material is gripped directly between the flange of the socket or inverted cap, as described in lines fourteen to sixteen of page 5 of the printed specification of said patent. The exhibit also has the three parts of which the button-hole member is composed separate from one another, as they appear before the ring is applied to the flange of the socket and before the socket and cap are connected in the act of attaching these parts to the material.

(Adjourned.)

DEC. 11. 1888.

Cross-examination by THOMAS W. CLARKE, Esq., of counsel for complainant:

Cross int. 12. In which of the figures of the Dowler patent is the Defendant's Exhibit Dowler Fastener, as introduced by you, illustrated?

Ans. There are two fasteners in the exhibit, the button-hole member of one of which is substantially like that represented in Fig. 3 of the Dowler patent, and the button-hole member of the other of which is substantially like that referred to in the fourteenth to the sixteenth lines of page 5.

Cross-int. 13. Will you please mark in some way that one of the group of fasteners which you say is like Fig. 3 of the Dowler patent?

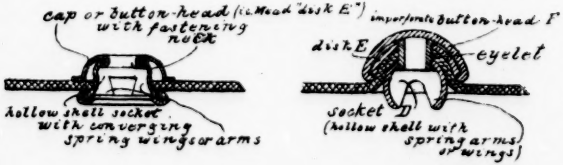
No. 289.

B. & S. Fastener Co. } pp. Exh. a

v.

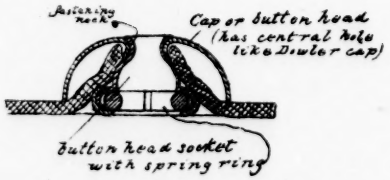
Kraetzer.

Dowler
British Pat. 795 of 1883



Mead
325688
Sep 1885

Kraetzer.



Defendant, Exhibit
Mead patent 325688
comparative diagram

A.E.L.
Spec'l Ex'r.

Ans. I have written "Fig. 3" on the under side of the leather of the fastener I referred to.

Cross-int. 14. Is the button member of the exhibit a solid or a hollow ball?

(Question is objected to as immaterial.)

88 Ans. I should judge from its appearance that it was solid.

Cross-int. 15. Is the button member of the exhibit fastened to the leather in a way illustrated in either of the Dowler patent drawings; and, if so, which of them?

Ans. I do not think that the button member in the exhibit is fastened exactly as is illustrated in any of the drawings of the Dowler patent.

Cross-int. 16. Does either of the drawings of the Dowler patent show a flange on the button-hole member of the fastener which is sufficiently small in size to pass within the circle of the cap of the patent?

Ans. I understand that the button-hole member includes both the socket that has the flange that rests against the under side of the fabric and the dome-shaped cap that is wholly on the upper side of the fabric when the fastener is attached. None of the drawings show the complete flange of the socket on the under side of the fabric small enough to enter into the inner opening of the dome-shaped cap.

Cross-int. 17. What you have called the socket in your last answer is called in the Dowler patent the dome or cup b, is it not?

Ans. I have meant to include besides the cup the guard ring b^3. The dome cup with the guard ring when used is what I call the socket, and I should call the dome cup b alone the socket if it were used without the guard ring. When I spoke of the complete flange I meant to include the guard ring as a part of the flange of the socket portion.

Cross-int. 18. The exhibit in the instance in which the parts are assembled upon a piece of leather has the grip on the leather between the edge of the flange b^3 inside of the dome or cup b and the interior of the dome cap k, do they not?

Ans. No; I think not. In the first place, I do not think that in either of the exhibits the edge of the flange b^3 is inside of the cap k, but is a short distance below the lower edge of the cap k. In the second place, I do not think that there is sufficient space between the outer diameter of the flange b^3 and the inner diameter of the cap k to receive the thickness of the material to which the fasteners are attached. It is possible that the dome cap in both exhibit fasteners bends the leather down a little over the outer edge of

89 the flange b^3, although it seems to me that the main grip on the leather is between the upper surface of the flange b^3 and the under rather than the inner edge of the dome cap. The leather is so soft that it is difficult to tell just where the grip does come without destroying the exhibit, but it appears to me to be more nearly as I have just stated than as stated in the question, but it is

probable that the real grip is intermediate between the two ways and not wholly and decidedly in either.

Cross-int. 19. You did not see the button-hole member assembled upon the leather in either of the two attached exhibits, did you?

Ans. I did not see the act of assembling. I did not see the exhibit in the form in which it now exists before being fastened.

Cross-int. 20. Then you cannot say whether the hole in the leather punched for the attachment of the button-hole member of the exhibits was sufficiently large to pass the dome or cup *b* entirely through it and have the leather rest flat upon its flange b^3, did you?

Ans. I cannot say positively what was the size of the hole made in the leather.

Cross-int. 21. The Dowler patent describes, does it not, and the Dowler drawings show, do they not, that the dome or cup *b* is passed through a hole in the material from the back thereof, so that its ring b^3 bears on the under side of the material, page 4, line- 51 to 53; also that the dome or cup *b* is on the upper side of the material, being passed entirely through it with the exception of the flange and a short neck above the flange?

Ans. The parts are shown and described in the Dowler patent in the manner stated in your question.

Cross-int. 22. Placing now the detached parts which correspond to the cap *k* and the cup *b* of the Dowler patent as they are represented in the exhibit together as shown in the Dowler patent, do you think that the engagement between the metallic portions of the assembled exhibits and the leather is such an engagement as would be made were the hole in the leather of sufficient size to pass the cup entirely through the hole?

Ans. I do think it is and I believe that the hole in the leather of the exhibit is sufficiently large to pass over the dome of the
90 cub *b*, although, as I before said, I am not positive as to the size of the hole.

Cross-int. 23. The largest part of the cavity of the cup *b* of the Dowler is above the plane of the leather as shown in the patent, is it not?

Ans. It is.

Cross-int. 24. The inner edge of said cup *b*, which engages with the shank of the button member, is in the plane of the fabric, is it not?

Ans. Substantially so.

Cross-int. 25. And it is radially within the hole in the leather, is it not, as compared with the vertical axis of the cup *b*?

Ans. The most contracted part of the cup *b* is surrounded by the edges of the hole in the leather substantially, if that is what you mean.

Cross-int. 26. The most contracted lower part of the hollow socket of the button-hole member of the Mead fastening No. 325,688 is below the lower surface of the fabric to which it is attached, is it not?

Ans. It is.

Cross-int. 27. And the circumference of the hole in the fabric

through which the hollow socket of the Mead fastener is attached to the fabric is at a less radial distance from the vertical axis of the hollow socket than the distance from the same vertical axis of the lower edges of the socket?

Ans. The hole in the fabric is of smaller diameter than the opening or mouth at the lower edge of the socket.

Cross-int. 28. Then, in short language, it would be proper to say that the methods of attaching the Mead and Dowler sockets to the fabric are distinguished from each other in these respects: That in the Mead fastener the hole in the fabric is always smaller than the diameter of the socket, and in the Dowler patent the hole in the fabric is always larger than the diameter of the socket; in the Mead patent the griping edges of the socket are arranged below the fabric which surrounds the whole, while in the Dowler patent they are in the plane of the fabric which surrounds the whole; in the Mead patent the engagement between the fabric and the metallic parts of the fastener is above and within the circle of the griping jaws,
91 while in the Dowler patent it is on a level with and outside of the griping jaws. Is not this a fair statement of the distinctions?

Ans. I do not think that there is any distinction between the methods of attaching the Mead and Dowler sockets to the fabric, but, so far as I can see, the methods are substantially the same; but, further than this, I do not think that the statement in the question is a fair or proper statement as to the essential distinctions between the relations of the parts of the fastener to one another and to the fabric in the Mead and Dowler fasteners, although it does state truly, I believe, the distinctions of these relations as they happen to be shown in the drawings of the Mead and Dowler patents. What seems to me to be a fair statement of the essential distinctions or differences, if there be any, is this: In the Mead fastener the hole in the fabric cannot be larger than the largest diameter of the socket, because, if so, the socket would pull through, while in the Dowler the hole in the fabric may be as large as the largest diameter of the socket, exclusive of its flange, although it is not necessarily larger, but probably is always somewhat smaller. I think that it is true that the griping edges—that is, the most contracted part of the mouth of the Mead socket—is essentially below the plane of the fabric, while the corresponding edges or mouth of the Dowler fastener is substantially in the plane of the fabric. In the Mead patent the engagement between the fabric and the metallic part of the fastener is above the circle of the griping jaws, although I do not think it is necessary that the part of the fabric engaged should be smaller than the circle of the mouth of the griping jaws, but only that it should be enough smaller than the largest diameter of the socket not to stretch out over the socket, and, on the other hand, I do not think it essential for the proper attachment of the Dowler fastener that the parts of the fabric engaged should be on a level with the griping jaws. The size of the hole to be made in the fabric and the parts of the fastener against which the fabric will lie when the fastener is attached will depend largely on the thickness and

firmness of the fabric, and it seems to me to be wholly immaterial as long as the fabric is securely held between the socket piece at one side and the dome cap at the other side.

Cross-int. 28½. Does there happen to be described in the
92 Dowler patent any structure specifically different in the characteristics set forth in the last question from the structure which you referred to in your evidence-in-chief as the structure of the Dowler patent having bearing upon this case and which embodies the dome cup *b* and the dome cap *k*?

Ans. As I understand the question, there is not.

Cross-int. 29. Does there happen to be described in the Dowler patent any structure from which you infer that the hole in the fabric through which the cup *b* is passed will probably be smaller than the size of the mouth of the cup *b*?

Ans. There is nothing described, I believe, in the Dowler patent as to the size of the hole, except that the dome or cup is passed through a hole in the material from the back thereof, so that its rim, b^3, bears on the under side of the material. The material is shown in the drawings as close up to the neck or narrowest part of the socket, so that it must have been stretched somewhat in passing over the largest part of the socket above the contracted neck. This indicates that there is no exact relation between the size of the hole punched in the fabric and the size of the metal that must pass through the hole, as would be the case if the fabric were of rigid material like metal. From the whole structure of the Dowler fastener I infer that there is no necessary or absolute relation between the size of the fastener and the size of the hole punched in the fabric, and I infer that, in applying the Dowler fastener to the fabric, the hole originally made in the fabric would frequently be made smaller *and* the neck or mouth of the socket, especially if the fabric or material were very soft and yielding, and that in applying the socket it would naturally be pushed through the hole and stretch the material around the hole to a greater or less degree. The size of hole made in any case would depend largely on the judgment of the person applying the fasteners, and I think that no one would believe it to be necessary or desirable, in applying the Dowler fasteners to a thin, soft material like kid, to make the hole in the kid large enough to pass the dome top of the socket through without any stretching whatever.

Cross-int. 30. A soft material like kid, when once stretched, does not by its inherent elasticity contract again, does it?

93 Ans. Not to any great extent.

Cross-int. 31. Is there any other treatment of the material to which the fasteners of the Mead patent are attached described in the patents or shown in the drawings thereof which does not involve the conformation of the material which surrounds the hole through which the fastener is attached to the fabric into a shape approximately the same as that of the outer upper surface of the socket?

Ans. I think there is a structure described in the Mead patent

which would not involve such conformation of the material to the back of the socket.

Cross-int. 32. Is this structure illustrated in the drawings as applied to a piece of material?

Ans. It is not.

Cross-int. 33. Will you please read the description of the structure to which you have referred from the Mead patent?

Ans. "The disk E may be a flat plate." If it were a flat plate I do not see that the fabric would be conformed to the back of the socket.

Cross-int. 34. Is it not said that the button-shaped cap F is previously struck up?

Ans. The specification in one place has the words, "Having previously struck up the button-shaped cap F," etc. I do not see that this statement has anything to do with the essential shape of the disk E, however.

Cross-int. 35. After describing the insertion of the button-shaped cap in a similarly shaped die and the setting of the eyelet by a round-ended plunger, does not the specification then use these words: "By this process the disk E approximates very nearly in shape to the outside periphery of the button head"?

Ans. That statement is in the patent after the description referred to.

Cross-int. 36. So that if the disk E started as a flat disk E, if the method of setting described in the patent were followed, the disk E would be concaved in the side toward the socket, would it not?

(Question is objected to as indefinite, as there is nothing in the question to indicate what, under the circumstances named,
94 the button head is, and also because it assumes that there is a method of setting described in the patent, which, as a matter of fact, there is not.

Counsel for complainant desired that Mr. Dowse may be sworn to this last statement.)

Ans. If the button head were used in the Mead patent, the forcing of the disk E into it would probably concave said disk on the side toward the socket, even if the said disk were originally flat—that is, the process of swaging the eyelet between the cap and the button head by means of a concave die and round-headed plunger described, beginning line 125 of page 2 of the printed specification, would undoubtedly concave the disk "E" even if it were originally flat; but I do not understand that such process refers to any essential method of attaching the fastener to the fabric, as the statement follows later on that the whole button head may be dispensed with without departing from the spirit of the invention. I will add that I am unable to find, although I have looked for it most carefully, anything whatever in the Mead patent that in any way indicates that the conforming of the fabric to the back of the socket formed any part of the Mead invention or is a necessary result of these essential features of the structure of the Mead fastener that are

described and claimed. This shaping of the fabric is possibly alluded to as an incidental advantage to that particular illustration of the Mead structure in which the disk E is shaped to fit the dome cap, but even here the relation of the fabric is merely alluded to indefinitely in the following words: "The latter (*i. e.*, the socket D) is maintained in close connection with the fabric A^2, and the parts D, E, F, and *l* are firmly united, thus completing the other member or enclosing portion of the fastening fabric," and this statement would be equally true if the disk E were a flat plate, as the specification distinctly states it may be.

Cross-int. 37. In the part of the Mead specification which you have referred to as allowing the button head to be dispensed with without departing from the spirit of the invention, is there not a reference to Fig. 12 of the drawings as showing how that alteration of the structure should be made?

95 Ans. There is a reference to Fig. 12, but the only feature referred to as required by this construction, other than what is required when the button head is used, is that the end of the eyelet must be made flush to secure a good finish, and such requirement would be equally applicable whether the disk were flat or dome-shaped. The only object of making the button head dome-shaped, so far as I can see that is pointed out in the patent, is merely to give it a good finish or pleasing appearance to the eye, and such shape is not described as related in any way to the shape of the socket or the part of the fabric engaged by the fastener in attaching it to the fabric.

Cross-int. 38. On referring to Fig. 12 of the drawings of the Mead patent, do you find the disk to be flat or concavo-convex, as there represented?

Ans. It is represented as convex on the outer side and concave on the side toward the fabric.

Cross-int. 39. When a man has built a structure which is entirely new and is useful, do you consider that that structure is that man's invention if he is not able to describe all the advantages which result from it?

Ans. Under the circumstances referred to, I regard the structure as the invention of the man who made it, whether he described or even knew all of its advantages or not; but when a man distinctly states that a portion of the structure that he invented may be varied, but that he rather prefers one form because it has some incidental advantages over the other, it does not seem to me that he can subsequently say that the preferred form is his invention, and that the other is not, or that such incidental advantages are of the real gist of his invention.

(Adjourned.)

DEC. 12, 1888.

Cross-int. 40. You have expressed yourself as familiar with the letters patent to Richardson, May 1, 1883, No. 276,741, and have, I believe, referred to it as showing the button-hole member of the

fastener as a socket adapted to engage with a ball on the end of an arm. Will you please state if there is not in that patent an illustration of such a socket fastened by its centre to the material

96 by means of an eyelet, and being Fig. 17 of the drawing, and a description of it in these words: "Of course the socket may be fastened in place to the material by means of a rivet or eyelet passed through the hole in the part *c* or through its bottom *a*, as represented in Fig. 17."

Ans. There is such illustration and description.

Cross-int. 41. The illustration, Fig. 17, of that patent does not show the conformation of the material to the convex outer surface of the socket, does it?

Ans. It does not.

Cross-int. 42. Do you think that a socket fastened to the material by an eyelet and flat disk was invented by Mead, in the sense in which you have used the words invented and invention hitherto?

Ans. I do not think that Mead was the first inventor of the structure referred to in the question, and, from his patent, it does not seem to me that he believed himself to be the first inventor of such structure without further limitation than what is stated in the question.

Cross-int. 43. All the disks E shown in the drawings of the Mead patent 325,688 are concavo-convex, are they not?

Ans. They are.

Cross-int. 44. All the references to the fastening disks which cooperate with the hollow socket D of the Mead patent which are contained in the claims of the Mead patent are references to it as a concaved collet or disk or as a button head, are they not?

Ans. The part mentioned in the claims as the part by which the socket is attached to the material is called a button head in claims 4, 5, and 6, and an eyelet, 1, in claim 7, in which it is also stated that the eyelet rests upon and within an annular *op*pression, *q*, formed in a concaved collet or disk, E. These are the only references in the claims to the part by which the socket is fastened to the fabric.

Cross-int. 45. Please now take the Schloss English patent 1450 of 1870 and say if the springs which engage the neck of the button member of the device of the Schloss patent are formed upon or in the edge of a cup which encloses the head of the button member and which when fastened to the fabric lies upon the under side of the fabric.

97 Ans. They are substantially so. The tubular neck *e* is the cup, and the said neck with the spring edges form part of a piece having a flange that engages the under side of the fabric, being held thereto by another piece at the upper side of the fabric, interlocked with the tubular neck or cup. The greater part of said cup projects through the hole in the fabric and is above the fabric, but the part of the piece forming the cup or socket for the button head that engages the fabric in attaching the fastener lies upon the under side of the fabric, and it is wholly immaterial whether the fabric stands up along the sides of the cup or socket or not. For example, if, instead of actually removing a piece of the fabric, a slit

or two cross-slits were made in it, the fabric would extend up along the sides of the socket, and might extend far enough to bring the entire socket below the highest point in the fabric; but this would make no difference at all in the attached fastener and no material difference in the way of attaching it.

Cross-int. 46. Is there any other drawing in the Schloss patent except Fig. 12 which shows the engagement of the inclined teeth around the hole *d* with the button member *b* of the Schloss fastener?

Ans. There is not.

Cross-int. 47. The point of engagement between these inclined teeth and the button member in that drawing is shown to be entirely above the level of the fabric to which the button-hole member of the fastener is shown as attached, is it not?

Ans. It is above the level of the fabric.

Cross-int. 48. Am I right in supposing that the cylindrical part of the Schloss device, *e*, taken in connection with the spring arms which surround the hole *d*, is what you consider the cup upon the edge of which the springs of that patent are formed?

Ans. That cylindrical part, with the inwardly projecting bottom portion, is what I consider to be the cup upon the edges of which the spring arms are formed.

Cross-int. 49. And it is your opinion that that is a cup-shaped socket disposed upon the under side of the fabric in the same sense as the socket of the Mead patent is a cup shaped socket disposed upon the under side of the fabric, is it?

98 Ans. I, of course, recognize specific differences between the cup sockets of the Mead and Schloss fasteners. I am of the opinion, however, that unless the Mead cup socket be restricted to the specific one shown in the Mead patent—that is, to a shell the upper half of which is unbroken except at a central attaching opening, and the lower part of which is composed of spring arms projecting downward from such upper parts and toward one another—then the parts of the Schloss patent referred to would be substantially the cup socket of the Mead patent. In other words, if the term "cup socket" disposed at the under side of the fabric means only a socket having contracted spring edges through which the head of the button is passed, and said socket extending above such spring edges to form a shell that surrounds and to a greater or less extent fully encloses the button head after it has been passed through the spring edges, and which shell is interlocked with another part which engages the upper side of said fabric, then, in that sense of the term, I am of the opinion that such cup socket is equally in the Schloss, Dowler, Mead, and Kraetzer fasteners.

Cross-int. 50. Taking now your own words, do you find in the art prior to the date of the Richardson patent No. 276,714, of May 1, 1883, any socket extending above its spring edges to form a shell that surrounds and to a greater or less extent fully encloses the button head after it has been passed through the spring edges, which shell is interlocked with another part, which engages the upper side of the fabric?

Ans. I do, as I have just stated, in the Schloss English patent.

Cross-int. 51. Is the enclosure performed by the shell of the Schloss English patent an enclosure of the button head after it has passed through the spring edges, to use your own words, "to a greater or less extent"?

Ans. I used that term because there are differences in the degree to which the socket extends over the button head in the different fasteners to which I referred. I think, however, that it surrounds and encloses to substantially the same extent in all the fasteners referred to in my last two answers except the Kraetzer and Dowler—that is, in the fastener of the Schloss English patent, in that of the Richardson patent No. 276,714, Fig. 17, and of the Mead patent, No. 325,688—the socket itself wholly encloses the part of the
99 button head above the spring mouth, except at the central attaching opening of said socket, which opening is itself closed by the part at the other side of the fabric to which the socket is attached, so that in all these fasteners the button head is completely surrounded and enclosed and is wholly inaccessible and invisible from the top of the button-hole member or upper side of the fabric. The Kraetzer, Dowler, and Fig. 12 modification of the Mead fastener differ only to the extent that the fastening opening of the socket is not closed by the part with which it is interlocked, so that the button head is visible and to a certain extent accessible from the outer side of the complete fastener or fabric. For this reason I should say that the greater extent referred to by me applies to Schloss, Richardson, and Mead, except Fig. 12, and the less extent applies to Kraetzer, Dowler, and Mead Fig. 12. In all of them the side walls of the socket extend to or above the top of the, to a greater or less extent, enclosed button head, and the side walls perform substantially the same function, being merely a means for connecting the contracted spring-mouth portion that grasps the button below the head with a part at the other side of the fabric. Of course, I recognize that in the Richardson patent the socket is at the upper or exposed side of the fabric, and that there is not a separate disk on button head at the under side of the fabric with which the eyelet is interlocked, but that said eyelet itself forms the part at the other side of the fabric to which the socket is attached.

Cross-int. 52. Do you mean by all that that the walls *e* of the drawings of the Schloss patent do extend inward over the top of the button member *b* of that patent?

Ans. Certainly I do not, as it is perfectly obvious that they do not.

Cross-int. 53. Do you find any reference in the Schloss patent to which I called your attention in Int. 51 to the Kraetzer, Dowler, Richardson, or Mead fasteners or fastener patents which you talked about in answer to the question?

Ans. Of course, the Schloss patent does not refer to the other patents or fasteners mentioned, as they were not in existence at the time of the Schloss patent.

Cross-int. 54. You consider, do you, that an enclosing wall
100 which has no portion of a roof at its summit more com-

pletely encloses an object within the periphery of the wall and below its summit than an enclosing wall which has a section of a roof projecting inward from the summit of the wall?

Ans. No; but I consider that a structure composed of a wall provided with a good tight roof more completely encloses an object than a wall that converges so as to make what might possibly be called part of a roof, but has a big hole left in it.

Cross-int. 55. Do you consider the cap or cover piece of the Schloss patent and the projection *f*, which is screwed into the cylindrical projection *e* of that patent, as a part of the socket of the device of that patent?

Ans. When the fastener is attached and in use those parts constitute a part of the socket that encloses the button head. If I were speaking of the detached parts of which the fastener unattached is composed, I think it would be proper enough to call the under piece the socket piece, as it is the piece having the spring mouth that is the really essential part of the socket piece when in use as a fastener, and of course the cover piece and projection *f* form no part of such socket piece.

Cross-int. 56. When the Schloss patent is attached the socket that encloses the button-head, which you refer to in the first part of your last answer, has the whole of its roof above the plane of the fabric, does it not?

Ans. It does.

Cross-int. 57. And it has no part of its interior wall *f*, except, perhaps, the very lowest portion of the edge, below the lower part of the fabric?

Ans. It has not.

Cross-int. 58. Please look at the Bayer English patent, being No. 809 of the series of 1887, and tell me what part of the device in that document is the part which you call the socket, and how it is described in the descriptive part of the specification and how it is lettered in the drawing.

Ans. It is the split ring at the under side of the fabric through which the button head is passed. It is marked "C" on the drawing and is described as follows:

101 "C is a perforated metal plate stamped upon a slightly convex form like an eyelet. It is provided with two holes, D, for the fangs B to pass through, and is divided at one side, C, to enable it to spring slightly when the stud is inserted. The dome A is fixed on the front surface and the eyelet C on the back portion of the surface E of the article of wearing apparel."

The terms "front surface" and "back surface" mean the same as what I generally call the upper and under surface in speaking of the other fasteners.

Cross-int. 59. Am I to understand from that that you consider the thing called in the quotation you have made the dome A as part of the socket?

Ans. I should answer this question about as I did a similar question referring to the Schloss fastener—that is, in the attached fastener I might possibly call the dome A a part of the socket, as it

encloses the button head after it has passed through the spring mouth. If, however, I were using terms to designate the different parts of the fastener I should call the plate C the socket piece and the dome the button head or cap which is employed to attach the socket to the fabric and give the button finish at the upper or exposed side of the fabric.

Cross-int. 60. Which part of the Bayer device would be correctly described as the enclosing portion of the button member of the fastener?

Ans. I do not think that either of such parts could be accurately so described with the exclusion of the other.

Cross-int. 61. Of that part of the socket which lies beneath the fabric in the device described in the Bayer patent should you consider that its centre was within or without the periphery of the split ring?

Ans. The central axis of the part of the Bayer socket that lies beneath the fabric is within the periphery of the split ring.

Cross-int. 62. Are the points of attachment between the split ring and the part of the Bayer fastener which lies above the fabric within or without the periphery of the split ring?

Ans. They are within the outer periphery of the split ring.

Cross-int. 63. These points of attachment are what is called in the Bayer specification the fangs B, are they not?

102 Ans. They are so called.

Cross-int. 64. These fangs project from the periphery of the dome A, which, when the contrivance is assembled, lies above the fabric, do they not?

Ans. They do.

Cross-int. 65. These fangs are represented as turned inward, to embrace the split ring, are they not?

Ans. They are.

Cross int. 66. Are the inner ends of the fangs attached to the dome A in any way?

Ans. Only through the fangs themselves.

Cross-int. 67. The part of the fang which is attached to the dome A passes down through the fabric and passes outside of the split ring, does it not?

Ans. It passes through a hole in the split ring, not wholly outside of it.

Cross-int. 68. The location of the attachment between that part of the Bayer socket which lies below the fabric and that part of the Bayer socket which lies above the fabric when the parts are assembled together would be, in your judgment, as well described by the words "secured together at their centres" as by the words "secured together near their circumferences," would it?

Ans. No; it would not.

Cross-int. 69. The location of the attachment between the Mead socket which lies below the fabric and the Mead button head or collet which lies above the fabric when the parts are assembled would be as well described by the words "secured together near

their circumstances" as by the words "centrally secured or centrally attached," would it?

Ans. Hardly. Neither expression would be accurate, but I think that the latter one would more nearly convey an idea in accordance with the fact.

Cross-int. 70. It would be as accurate, and perhaps a little more accurate, to describe the contrivance which you testified about in the last answer as centrally secured as it would be to call the part under the fabric in the Bayer device a socket portion, when the word

103 "socket" appears in the Richardson and Mead patents as a term of art designating a portion of a clasp which nearly surrounds the botton head with which it is engaged on all sides, would it?

Ans. I do not think that degrees in inaccuracy can be easily weighed and compared. The term "centrally secured" means having its centre secured or attached — is certainly inaccurate. The term "socket or socket portion" seems to me perfectly proper and accurate to apply to the Bayer split ring, in the light of the way that term is used in the art. I can see no reason why the special form of socket shown in the Mead patent or in Richardson patent, No. 276,714, should be the one special form of socket to which all other sockets must be referred to find out whether they can be accurately called sockets or not any more than that the sockets called by that name in patents 300,508 and 300,510 should be chosen as such criterion; and if the term is accurately employed in said patents Nos. 300,508 and 300,510 it is certainly equally accurate to call the split ring B of the Bayer patent the socket or socket piece.

Cross-int. 71. Bayer didn't call it so, did he?

Ans. I believe not.

Cross-int. 72. In the comparative diagram marked "Defendant's Exhibit Mead Patent No. 325,688," how do you understand the pinch upon the fabric is made in that device which is under the word "Kraetzer" to prevent the fabric from being stretched over the bell or dome of the socket portion?

Ans. I do not understand that there is any pinch upon the fabric at all. I have cut apart and pulled apart several of the Kraetzer fasteners and have torn the leather out from some without disturbing the fastener itself for the purpose of seeing how the fabric is engaged, and have come to the conclusion that in most cases it merely holds by the strength of the fabric around the opening, which is not weak enough to pull off over the enlarged part of the fastener below the hole in the fabric under the ordinary strain to which the fastener is subjected. The fabric merely holds like a ring or link in a chain thrown over a pin and prevented from pulling off from the pin by an enlargement of the pin on each side of the part engaged by the ring and too large for the ring to slip over.

It certainly is not necessary for the secure attachment of the

104 Kraetzer fastener that the fabric should be pinched at any point, and, as a matter of fact, it is not always so pinched, but in many cases it is not pinched at all. It is somewhat difficult to tell where the pinch comes in those cases where it does exist, as that

depends somewhat upon the thickness of the material and the size of the hole. It would probably always be one or the other of two points—that is, either around the edge of the hole or around the upper and outer edge of the part that encloses the spring ring.

Cross-int. 73. In attaching the button-hole member of the Kraetzer fastener to the fabric, how large a hole do you understand need be made for the purpose of assembling the parts together upon the fabric? Please give this measurement in comparison with the hole in the button-head portion of the Kraetzer fastener.

Ans. The size of the hole would depend largely on the person who applied the fastener. It would have to be large enough to let the neck of the spring chamber pass through, forcibly or otherwise, and it should not be large enough to make any danger of pulling off over the entire spring chamber. I think that it would usually be punched about the same size as the hole in the cap piece, as this would be large enough and there would be no advantage in making it larger.

Cross-int. 74. In assembling the fastener upon a piece of fabric through such a hole as you have described as sufficient, where would the material next the hole be situated when the parts were riveted together—at or about the central or upper part of the socket member, would it not?

Ans. I think it would.

(Adjourned.)

DEC. 13, 1888.

Cross-int. 75. I show you a model which I have tagged with the title of this case and the words "Cut Model No. 1, shown to Mr. Livermore Dec. 13, 1888," and which, I believe, represents the Mead fastener assembled upon a piece of buckskin, and ask you if it is a fair representation of Fig. 12 of the Mead patent.

Ans. I think it is not exactly. The fastening neck or part by which the cap and socket are interlocked or fastened together, with the fabric between, appears to be a part of the cap itself and not a separate eyelet with its flange dropped into a recess in said
105 cap, which I understand is one of the features to which considerable importance is given in the reference to Fig. 12 in the Mead patent; otherwise it represents fairly, I think, the relation of the socket, cap, and fabric of the fastener represented in Fig. 12 of the Mead patent.

Cross-int. 76. This difference to which you have invited attention is, in fact, a difference which consists principally in forming the barrel of the eyelet and that part which makes its riveting flange on the socket, aside from the central portion of the dome-shaped collet, instead — from a separate piece, is it not?

Ans. That is another way of stating the difference to which I called attention.

Cross-int. 77. The leather in this case is modelled up into the form of a mamelon, is it not?

Ans. It is.

Cross-int. 78. In order to assume this shape the leather requires to be slightly stretched, does it not?

Ans. It does. The dome form has a larger surface than the original plane of the leather.

Cross-int. 79. Do you know that there is a law of nature respecting the strength of materials and the modulus of elasticity, which is substantially this: That any material which has been stretched or compressed by a given force cannot, without being annealed or restored to its initial condition, be further stretched, if it has been stretched or compressed, if it has been compressed, without an application of a greater force than was originally applied to produce the first stretch or compression, and that this law obtains up to the point where disintegration of the material begins?

Ans. That seems to me to be a true statement of the relation between the internal or molecular forces of any material and an external force that tends to change the molecular condition of the material up to that point at which the internal or molecular forces are able to restore the molecules to their original condition with relation to one another when the external forces by which the molecules were strained are removed. The word "stretch," however, I think would generally imply that the molecules have
106 been strained beyond their power of coming back to their original condition, or that the disintegration referred to has, to a certain extent, begun, and where such a stretching as this has taken place I do not know that the relation between external and internal forces holds as stated in the question for all materials, but believe that it does not.

Cross-int. 80. You then limit the application of this law within the modulus of elasticity?

Ans. I do not know that it applies for all materials beyond this limit.

Cross-int. 81. Please now look at the model tagged with the title of this case and the words "Cut Model No. 2, shown Mr. Livermore Dec. 13, 1888," and say whether or not the leather on which cut model No. 2 is mounted is substantially the same quality of leather as that on which cut model No. 1 is mounted.

Ans. It seems to me to be the same.

Cross-int. 82. Please look at the metallic parts on cut model No. 2 and say whether or not those metallic parts fairly represent the metallic parts of the button-hole portion of the Kraetzer fastener, such as are shown in "Defendant's Exhibit Kraetzer Fastener, Dec. 1, 1888," except that one-half of the button head is cut away.

Ans. They appear to me to fairly represent them.

Cross-int. 83. Please state whether those parts are assembled upon the leather in substantially the manner described by you in answer to Ints. 73 and 74 of your examination.

Ans. I think they are.

Cross-int. 84. In the Kraetzer patent, No. 359,614, of March 22, 1887, the structure exhibit in cut model No. 2 is substantially shown, is it not?

Ans. It is substantially.

Cross-int. 85. It is also substantially shown in letters patent No. 359,615, of the same date, is it not?

Ans. With the exception of the difference in the top of the spring chamber or socket part, I believe that it is. In the patent referred to in the question the fastening neck is closed at the top so as to completely fill and cover the opening in the cap at the upper side of the fabric.

Cross-int. 86. In the patent No. 359,614 I find these words:

107 "The spring case H or chamber shell enclosing the spring is composed of a somewhat conical eyelet or shell, having an enlarged opening and provided with an interior annular shoulder, *e*, and connected by a semispherical portion, terminating in a contracted neck or tubular end portion adapted to fit closely within the opening or hole *c* formed in the said outer cap, D, when secured together;" and in patent No. 359,615 I find these words: "A represents the top shell or cap, formed of sheet metal and provided with a central opening, B, surrounded by an annular depression or countersunk cavity, as shown in Figs. 9 and 10. The said opening B is adapted to receive the upper end, C, of the spring shell D. * * * This shell D is formed of sheet metal, having a somewhat conical shape and provided with an internal annular shoulder, E, adapted to retain the split ring or circular spring H in its relative position within the said shell D when it is secured therein by means of the annular flanged spring retainer G;" and I understand from this description that the socket portion of the Kraetzer fastener has at the top a riveting shank, for the purpose of being engaged with the button head, which is entirely upon the upper side of the fabric. Am I correct in this?

Ans. I understand it to be so.

Cross-int. 87. I understand also, from this description, that from the lower end of this riveting shank the shell expands into a semispherical or dome shape for a short distance. Am I correct in this?

Ans. I understand it to be so.

Cross-int. 88. The cavity of this semispherical part of the shell is sufficiently large to contain, and when the button-hole member of the fastener is engaged with the button member does contain, the ball which is formed on the upper end of the button member. Is this also correct?

Ans. It does contain the enlarged part or head of the button member.

Cross-int. 89. At the lower end of this semispherical part of the shell is formed the spring chamber, is it not?

Ans. The annular recess or chamber that encloses the spring is formed at the lower end of the dome-shaped part.

108 Cross-int. 90. The spring contained in the spring chamber engages with the neck of the button member by this arrangement of parts close to the surface of the fabric to which the button member is attached, does it not?

Ans. It engages at some little distance from the nearest surface of the fabric, a distance of more than the thickness of the spring wire itself.

Cross-int. 91. The engagement between the button member and the button-hole member of the fastener is much nearer the fabric to which the button member is attached than it is in the Mead patent, No. 227,440, of May 11, 1880, or than it is in the Pringle patent, No. 260,411, of July 4, 1882, is it not?

Ans. It appears to be relatively considerably nearer.

Cross-int. 92. The same point of engagement is much farther from the upper side of the fabric to which the button-hole member is attached and in an opposite direction from said upper side than is shown in said Mead patent of 1880 and Pringle patent, is it not?

Ans. It is.

Cross-int. 93. The point of engagement is also farther from the under side of the same part of the fabric and in the opposite direction in the Kraetzer fastener than it is in the Mead fastener of 1880 and in the Pringle?

Ans. No; I should say that the point of engagement in the Kraetzer fastener was nearer the under side side of the fabric than the fasteners of the Mead and Pringle patents referred to, and in the same direction—that is, it is above the under surface in all of them. I understand that these last questions all refer to the relations shown in the drawings of the Kraetzer patents Nos. 359,614 and 359,615.

Cross-int. 94. Do you mean to be understood that whether the margin of the hole in the fabric through which the spring chamber of the Kraetzer fastener is united with the button head be large or be small, there is not above the spring chamber a portion of the fabric surrounding the hole?

Ans. I do not. I may possibly have misunderstood the meaning of the last two or three questions, and to make my own meaning clear now explain that by upper and under surface of the
109 fabric I meant, and understood the question to mean, the upper and under surfaces of the fabric lying around the fastener as a whole.

Cross-int. 95. Please now answer cross-int. 92 and cross-int. 93 with the understanding that the upper side of the fabric referred to means the upper side of the fabric which surrounds the hole through which the tubular rivet which unites the parts on opposite sides of the fabric is passed.

Ans. In answer to cross-int. 92, with this understanding I should say that the point of engagement of the button head is about the same distance from the upper side of the fabric around the hole in the Kraetzer, Mead, and Pringle patents referred to and is in the opposite direction, being below in Kraetzer and above in Mead and Pringle. In answer to cross-int. 93 I should say that the point of engagement of the button head in the Kraetzer was rather nearer the side of the fabric around the hole than in the Mead and Pringle patents and in the opposite direction, being below in the Kraetzer and above in Mead and Pringle. It is difficult to estimate what the actual distances are, and I merely speak with relation to the general appearance of the fasteners shown in the drawings, estimating

the distance with relation to the size of the fasteners and thickness of the fabric there represented.

Cross-int. 96. In the device of the Dowler patent as represented in the drawing the point of engagement between the button member and the button-hole member of the fastener is abreast of the fabric which surrounds the hole through which the socket portion and cap portion are assembled together on the fabric, is it not?

Ans. Substantially so or possibly a trifle above. It is difficult to determine just what the point of engagement between the button head and socket is, as they are shown as making contact over a considerably wide band on the button head.

Cross-int. 96½. If in applying the Kraetzer fastener the hole through the fabric was originally punched of sufficient size to permit the passage of the semispherical shell above the spring chamber and the parts were then assembled, would it or not require a greater strain to pull the fabric from between the button head and spring chamber than it would to similarly pull the fabric from between the button head and spring chamber where the hole was made large enough or about large enough for the passage of the tubular portion of the spring chamber or shell in such an assemblage as you have described, where there is no nip upon the fabric between the socket part and the cap part of the button-hole member?

Ans. I do not feel sure that under either one of these said two conditions the fastener would always hold stronger than under the other. It seems to me that it would largely depend on the nature of the fabric. I think that in most cases it would hold stronger with the smaller hole than with the larger, but that with some kinds of material, such for example, as a rather brittle, non-elastic material, the holding power might be about the same, and I think that it might happen that with some fabrics the holding power would be greater when the larger hole was used.

Cross-int. 97. What buttonable garments are made of the mysterious fabric to which you have last referred?

Ans. I had in mind experiments that I have seen tried with button boot fasteners on materials used for uppers of women's shoes. Some of the materials used—that is, certain classes of leather used—seemed to come rather nearer stout brown paper in strength and toughness than to good leather, but the material is used and the shoes are sold and worn, and the button-fasteners, at any rate, have to be made with reference to their possible use on material of this kind. I may add that with good materials I think the Kraetzer fasteners would hold securely in garments to which they are applied with the holes made in the fabric in either of the ways referred to in cross-int. 96, although with a very stretchy material, like thin kid I should not think it advisable to use the larger hole.

Cross-int. 98. Didn't you consider these burnt thin-skin boots, which I believe is the technical name for that kind of leather, as exhibiting somewhere near the perfection of badness in leather?

Ans. I should think it about as poor leather as could be produced.

Cross-int. 99. What kind of fasteners did you see tried upon it?

Ans. Some of the fasteners were a kind of steel staple, the two prongs or ends of which were pricked through the leather and clinched. I saw two or three other kinds tried to test the relative holding power of the different kinds, but do not recollect their exact construction. The staples to which I refer are in very general use.

111 Cross-int. 100. In the contrivance which you have explained in your last answer there was no flange surrounding the hole and seeming in any way to bind or protect the margin of the hole, was there?

Ans. There was not. I have not intended to convey the idea that the action of these boot button-fasteners on the material was at all like that of the buttons about which I have been testifying, but merely that I learned that different materials acted very differently, so that I could not feel sure that either one of the two sizes of hole referred to in cross-int. 96 would invariably afford greater holding power than the other.

Cross-int. 101. Please examine a model tagged with the title of this case "Model No. 3, shown to Mr. Livermore Dec. 13, 1888," and say whether or not the two detached pieces of thin brass fairly represent the devices of the Dowler patent called in that patent eye part of the fastening, and illustrated in Fig. 3 and Fig. 4, namely, the dome or inverted cup *b*, perforated at its top and having at its mouth a flange, b^2, the dome or cup *b* being slightly contracted at *h* near said flange when this eye part is made without the guard ring b^3, as is described in lines 14, 15, and 16 of page 9 of the patent, and also the dome-shaped cap *k*, the upper edge of which is eyeleted around the hole in the top of the dome or cup *b*, as seen in Figs. 3 and 4, and marked *l*, before such parts are assembled upon the fabric.

Ans. I think it fairly represents the parts of the Dowler fastener referred to.

(The three models shown Mr. Livermore are identified by the initials of the examiner, "A. E. L., special examiner.")

(Adjourned.)

DEC. 24, 1888.

Direct examination resumed:

Int. 102. In view of the fact that on account of the number of patents involved your direct examination was somewhat long and as your cross-examination has been confined exclusively to the Mead patent, No. 325,688, will you now state whether or not you have changed your mind in regard to said Mead patent; and, if not, will you please state as concisely as possible what novelty, if any, there is shown in said Mead device?

112 (The misstatement of the above concerning the cross examination is objected to as erroneous and irrelevant.)

Ans. I have not changed my mind about the said Mead patent. The only novelty in the Mead fastener as a whole consists in the combination of several old elements, namely, the Richardson socket,

illustrated in Fig. 17 of the patent No. 276,714; a button head, such, for example, as is illustrated in the Bayer British patent, No. 809 of 1877, or Dowler British patent, No. 795 of 1883, and a common fastening eyelet, by which these parts are connected together.

Comparing the Mead fastener with the one represented in Fig. 17 of Richardson patent No. 276,714, it is apparent that all that Mead has done is to put the said Richardson socket at the under instead of the upper side of the fabric and to interpose a disk or washer having a button finish between the end of the attaching eyelet and the upper side of the fabric. It was not new with Mead to put a spring-mouthed socket at the under side of the fabric, as Schloss, Bayer, and Dowler all show this construction, and Mead merely connected the specific Richardson socket with the fabric in substantially the same relations that other forms of socket had been connected before. What I have just said refers to the Mead fastener when considered sufficiently broadly or generally to include the modified constructions shown and described in the specification and drawing.

(Adjourned.)

DEC. 26, 1888.

Int. 103. Will you please explain what your understanding of the language in the Mead patent, No. 325,688, is, commencing with the words on the second page thereof, "The disk E may be a flat plate," and ending with the words on the third page, "since by this method the cost of the finished article is somewhat lessened"?

Ans. I understand that this means that there can be various modifications in the construction of the button head or part at the upper side of the fabric to which the socket at the under side of the fabric is connected, and also that it is not essential that the part that rests upon the upper surface of the fabric, namely, the disk E, should be concave on the side towards the fabric, but that it may be flat. I have prepared a diagram illustrating two of these modifications, namely, that in which the construction shown in Fig. 2 of the patent is employed, with the disk E a flat plate, and, second, one in which the construction shown in Fig. 12 is employed, with the disk E a flat plate. I have also shown on the same diagram, Fig. 17, of Richardson patent No. 276,714, which illustrates clearly the statement made in my last answer, that the main or sole novelty in the button-hole member of the Mead fastener, as distinguished from Fig. 17 of Richardson patent No. 276,714, consists in placing the socket (that is, that specific socket) at the under instead of the upper side of the fabric and introducing a disk between the upper side of the fabric and the attaching eyelet, said disk either being itself made to give a button appearance or finish or being surmounted and covered by a cap which gives the button finish. I also have several sample fasteners which, from my understanding of the portion of the Mead specification referred to in the present question, are within the Mead invention as described in the specification. Of these samples "Defendant's Exhibit Mead Modification No. 1" is an attached button-hole member and the detached head portion of a similar one

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having the construction represented in Fig. 2 of the Mead patent, but with the disk E a flat plate. This sample also has a piece of filling material, in the nature of leather board, interposed between the upper side of the flat plate and the inner side of the button-head cap to support the end of the eyelet while the other end is being upset or clinched inside of the socket. Such use of filling material I believe was well known at the time of the Mead patent. "Defendant's Exhibit Mead Modification No. 2" is a fastener substantially like that represented in Fig. 12 of the Mead patent, except that the disk E is a flat plate and does not have the rabbet or depression *q* to receive the flange of the eyelet. "Defendant's Exhibit Mead Modification No. 3" contains an attached fastener and corresponding unattached portions of the fastener, in which the button head and attached eyelet are made as a capped eyelet, the flange of said eyelet being unusually wide and performing the function of the disk E of the Mead patent. All these modifications are, in my opinion, clearly within the Mead invention, in view of that part of the Mead specification referred to in the present question, and illustrates
114 that the construction and operation of the Mead fastener is substantially the same whether the disk be flat or concave.

(Counsel for defendant introduces the exhibits referred to by Mr. Livermore in his last answer, and the same are marked "Defendant's Exhibit Diagram Richardson Patent 276,714, Fig. 17, and Mead Modifications,"—

(Here follows diagram marked p. 114*a*.)

"Defendant's Exhibit Mead Modification No. 1," "Defendant's Exhibit Mead Modification No. 2," and "Defendant's Exhibit Mead Modification No. 3," all being marked in this suit and with the initials of the examiner, "A. E. L.")

Int. 104. Do you find in complainant's Mead patent, No. 325,688, anything said about the relation of the fabric to the fastener or about what the size of the hole should be in attaching the fastener?

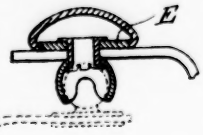
Ans. The following statements are made and I believe are the only statements referring to the size of the hole or to the relation of the fastener to the fabric: "I punched a hole in the material sufficient to enter the eyelet *l*." Then after stating that the end of the eyelet is inserted into the central opening of the socket D, "which has likewise been placed in position upon the under side of the material and centrally of the hole therein," the action of the die and plunger is described by which "the lower extremity of said eyelet is spread out * * * against the interior surface of the socket D and the latter is maintained in close connection with the fabric A^2."

These statements would be equally true of almost any contrivance intended to be attached to a fabric by means of the eyelet and do not, in my opinion, refer to anything more than or different from the ordinary plan of using a fastening eyelet to attach a device of this kind to the fabric.

No. 2887.
B. & L. Fastener Co. } p. 114a
v.
Kraetzer.

Richardson Patent
276,714. May 1, 1883.
Fig. 17.

Mead Patent 325688
Modifications with
disk E "a flat plate"



Defendants Exhibit diagram
Richardson Patent 276114 Fig 17
and Mead modifications

Int. 105. Do you find any statement in complainant's Mead patent, No. 325,688, about any stretching of the fabric when the fastener is attached? Will you also state what is the effect of any stretching of the fabric such as has been spoken of to make it conform to the upper side of the socket of the Mead fastener?

Ans. I find no statement in the Mead specification either of the fact that the fabric is stretched in attaching the fasteners of the shape shown in the drawings or is there any statement that the stretching of the fabric is desirable or objectionable or has any bearing
115 whatever upon the construction and operation of the Mead fastener or any other fastener. In my opinion, the effect of the stretching is practically wholly immaterial unless such stretching be carried too far. Theoretically, I think it is evident that the strength or holding power of the fastener in the fabric would be less when the fabric is stretched up out of its plane, as in the fastener shown in the Mead patent, than when it was not so stretched. For example, if it required twenty pounds pull to tear the fabric around the eyelet hole of the Mead fastener and the stretch was equal to what would be produced by a pull of ten pounds, then it would only require ten pounds additional pull to tear the socket through the fabric, while it would require twenty pounds pull to tear it through if the fabric were not stretched in the attachment to the fabric. While this is merely a theoretical consideration, I would add that I believe it is practically very objectionable to stretch the fabric in attaching the fastener to as great an extent as is shown in the Mead patent, in which the fabric is stretched substantially into hemispherical shape; or, in other words, the mamelon formed in the fabric is of the height fully equal to one-half the width of its base. I have seen numerous samples of fasteners, which I understand are now made, regarded as made under the Mead patent, and in all of them the socket is much flatter than shown in the Mead patent, and the part corresponding to the disk E of the Mead patent is also much flatter or shallower than shown in the Mead patent, so that the stretching of the fabric is much less, and the height of the mamelon formed in the fabric, instead of being as much as one-half the width of the base, is not more than one-third or one-fourth of the width. I now produce three or four samples, which I have referred to, in which the back of the socket is very much flattened instead of being a true hemisphere, as shown in the Mead patent, and in which the part corresponding to the disk E is very much wider in proportion to its height than is shown in the Mead patent, or, in other words, is much shallower than the disk E of the Mead patent. This change in shape seems to me an indication that the stretching of the fabric to the extent shown in the Mead patent is found to be objectionable.

(Counsel for defendant offers in evidence the two or three samples referred to by Mr. Livermore in his last answer, and the same
116 are marked "Defendant's Exhibit Sample Fasteners Now Made under Mead Patent No. 325,688, A. E. L., sp'l ex'r.")

Int. 106. Is any such stretching of the fabric, such as you have referred to, necessary in the attachment of the Kraetzer fastener?

Ans. It is not. The Kraetzer fastener may be effectually attached by having a hole made in the fabric large enough to receive the whole dome-cup portion of the socket, just as is shown in the Dowler patent. I have myself attached several of the Kraetzer fasteners in this manner and now produce such samples. The two fasteners on each piece of leather were applied with the same size hole in the leather and set in the same way, and I have cut away a portion of the cap of one of each pair so as to show the hole in the leather and its relation to the parts of the fastener. With strong, firm material I think this manner of attaching might be just as good when a smaller hole is used, and I think that in any case the stretching or rounding out of the fabric is of no value whatever, although with very soft, stretchy material it would probably be better to make the hole somewhat smaller so as to prevent the possibility of the material around the hole stretching enough to let the entire flange around the lower part of the socket pass through. Another sample: I have applied two fasteners by making the cross-cut in the leather so that the material is merely pushed aside in the act of attaching the fastener and is not stretched to any extent. On this sample one attached fastener has a portion of the cup removed to show the leather and there is one fastener unattached, but tied into a hole in the leather, the same as that by which the other two were attached.

(Counsel for defendant offers in evidence the exhibits referred to by Mr. Livermore in his last answer, and the same are marked "Defendant's Exhibit Kraetzer Fastener with Large Hole in Leather" and "Defendant's Exhibit Kraetzer Fasteners Cross-cut in Leather," both being marked in this suit with the initials "A. E. L., special examiner.")

Int. 107. Will you please compare the relation of the essential parts of the Kraetzer fastener to the fabric with the relation of the essential parts to the fabric of the other fasteners, such as the English Schloss, Bayer, and Dowler fasteners, and any others which may occur to you?

117 Ans. It seems to me that the only relation that in any way effects the operation of the fastener is that of the contracted spring mouth to the plane of the fabric around the fastener. The particular shape of those parts of the fabric that are enclosed within the metallic parts of the fastener when attached is in most cases wholly immaterial so long as secure attachment is afforded, and in many cases may be modified considerably without in any way affecting the operation of the fastener. In the Kraetzer fastener—I mean in the shape shown in "Defendant's Exhibit Brown Drawing" and in the comparative diagrams before referred to by me—the contracted mouth of the socket is substantially in the plane of the fabric, which is substantially the same relation as in the fastener of the Dowler patent. In the samples of Kraetzer fasteners to which I have referred the cap is made considerably shallower and does not depress the fabric to so great an extent around the edges of the flange

of the socket as in the said Brown drawing and diagrams, so that the contracted mouth or socket is a trifle below the under surface of the fabric, or in substantially the relation shown in the Bayer English patent. In the Mead patent the contracted mouth of the socket is considerably below the under surface of the fabric, and in the fastener of the Schloss English patent it is somewhat above the lower surface of the fabric. If the relation of the contracted mouth in relation to the hole in the fabric is a feature of the Mead invention, none of the Kraetzer fasteners that I have ever seen embody this feature, but they are, on the other hand, substantially like Bayer and Dowler fasteners.

With regard to the part of the fabric enclosed within the parts of the fastener when attached, this depends, as I have before stated, on the operator who attaches it, but in the Mead fastener the fabric, whether covered or plain, must lie back of the socket, while in the Kraetzer and Dowler fasteners it may or may not, as there is a flange around the lower part of the socket which is sufficient to hold the fabric if it does not extend over the back of the socket at all. The exhibit last introduced, "Kraetzer Fasteners with Large Hole in Leather," shows that the leather need not go over the back of the socket, and I have prepared a specimen of the Dowler fastener attached to leather, with a portion of the cap cut away, in which the leather does go over the back of the socket the way it does in
118 the Kraetzer fasteners as they are generally applied and as shown in Brown drawing. I have also other samples of the Dowler fastener applied to the fabric with a small hole, but with the fastening neck not clinched, so that the parts may be readily separated and removed from the leather. These samples show clearly that the Dowler structure has all the capabilities, in relation to the stretching of the fabric, that the Kraetzer and Mead fasteners have, but the Dowler and Kraetzer fasteners have a capability beyond Mead's of permitting the leather over the back of the socket to be removed, so that the fastener can be applied without stretching the fabric, but with the contracted mouth of the socket well up to the plane of the fabric, so that the head of the button member can pass above the plane of the fabric, bringing the pull substantially in the plane of the fabric, a result that cannot be accomplished with Mead's fastener without a considerable stretching of the fabric.

(Counsel for defendant offers in evidence the Dowler fasteners referred to by Mr. Livermore in his last answer, and the same are marked "Defendant's Exhibit Dowler Fastener, Leather Over Back of Socket," "Defendant's Exhibit Fasteners, Unattached, Small Hole in Leather," both marked in this suit with the initials "A. E. L., special examiner.")

Cross-examination resumed:

Cross-int. 108. Do you consider that the Mead invention is more extensive if it is interpreted as consisting in placing the specific socket of Fig. 17 of the Richardson patent, No. 276,714, on the under

instead of the upper side of the fabric and introducing a disk between the upper side of the fabric and the attaching eyelet, whether that disk be concaved towards the socket or flat, than it would be if interpreted as an invention which required the disk to be concaved?

Ans. I consider the first-mentioned interpretation to be the more extensive.

Cross-int. 109. On referring to the Mead patent, Fig. 2, please state whether the exterior edge of the disk E lies in a plane which is nearer to the upper surface of the fabric immediately around the hole through which the socket is attached than the flange on the inside of the socket formed on the attaching eyelet.

Ans. As I understand the question, it does not.

11? Cross-int. 110. If a fabric and socket were attached to the organization shown in Fig. 4 of the Mead patent, how would this relation of the flange of the eyelet and the disk E be, supposing the disk E and the button head were not changed?

Ans. It would be the same as stated in the last question and answer.

Cross-int. 111. Do you find in the Mead drawing any other relation between the upper surface of the fabric, the exterior edge of the disk E, and the fastening flange of the eyelet shown than one which makes the fastening flange nearer the upper surface of the fabric around the hole than the edge of the outer disk E?

Ans. I do not.

Cross-int. 112. For setting the eyelet in connection with a flat disk, are there any instructions given in the Mead patent other than such as will insure the concaving of the disk E? And, if so, please read from the patent what those instructions are, and state the page and lines in which they may be found.

Ans. I do not find that there are any instructions given at all for setting the eyelet in connection with the flat disk, other than those given for setting the eyelet when a concave disk is employed. Those instructions will, however, be sufficient to anybody familiar with articles of this kind to set the fasteners when a flat disk is used.

Cross-int 113. Those instructions, if followed by the employment of a die similarly shaped to the shape of a button-shaped cap and of a round-headed plunger to swage or press out laterally the lower extremity of the eyelet, would cause the disk E to approximate very nearly in shape to the outside periphery of a button head, would they not?

Ans. If the button head and die were concave on the side toward the disk E, and no filling were enclosed between the disk and said eyelet, the disk E would probably be concave on the side toward the socket, but there is no limitation as to the shape of the button head, and it might be made flat or with the outside convex, or, if the inside were flat, to support the plate E, if it were desired to have that plate flat, as mentioned in the patent. Any operator should know enough to use a die properly shaped to support the head of the eyelet while its end was being upset without disturbing

120 the other parts, if it was desired that the other parts should not be changed in shape in the act of setting the eyelet.

(Adjourned.)

DEC. 29, 1888.

Cross-int. 114. You find no instruction in the Mead patent for putting a filling between the disk and the button head, do you, in order to practise the Mead invention?

Ans. I do not.

Cross-int. 115. When a worker in sheet metal speaks of an article being struck up, does it imply that the article which is struck up is concaved on one side?

Ans. Not to my knowledge. I think, however, it usually implies that a flat blank or plain piece of metal has some portion bent or drawn out from the original plane.

Cross-int. 116. Please mention any article that is struck up which does not have a concavity on one side of it.

Ans. I do not know that I can think of any article by name, although I feel sure that many small articles, such, for example, as paper-fasteners and the like, are made by the process commonly called striking up that have nothing which could properly be called a concavity. It is common, for example, to make a V-shaped cup in a strip or plate of sheet metal and strike up the point of the V to one side of the plate so as to make a prong projecting from one side of the plate. This will, of course, leave an opening in the plate itself, but would not, I think, constitute what would properly have a concavity in the side of the plate.

Cross-int. 117. That manipulation you have just described is technically called bending out rather than striking up, isn't it?

Ans. I have certainly heard it called striking up by persons familiar with technical terms used by mechanics and who, I think, intended to use the term accurately. There is, however, great looseness in the use of terms applied to mechanical arts, and they are not carefully defined in their application by mechanics. My own understanding of this term, from the various cases in which I have heard it applied during the last six or eight years, is that it merely means the bending or changing of the shape of a malleable piece of sheet metal by pressure.

121 Cross-int. 118. You do not then understand that the words "striking up" is confined to displacement without cutting?

Ans. I do not.

Cross-int. 119. Will you please read me from Knight's Mechanical Dictionary the first paragraph of the striking-up press therein contained?

Ans. "(Sheet-metal working.) A press for stiking up or raising sheet metal in making dishes, pots, pans, cups, etc."

Cross-int. 120. Please read from Knight's Mechanical Dictionary the article on raising in metal-work.

Ans. "The process of forming circular work or embossing in sheet metal by the striking up or raising from the interior surface in case

of circular works, as candle-sticks, teapots, and other vessels and their covers. This is generally effected by spinning in the lathe. In other cases hammering is resorted to, the metal being raised and the desired form imparted by successive blows while the plate is placed on an anvil or former, care being taken to preserve as nearly as possible a uniform thickness throughout. Where large numbers of the same pattern are to be made, stamps and dies are usually employed (See embossing, spinning, and stamping.)"

Cross-int. 121. If you gave written directions to an operator to employ in a given work a concave die and he considered it more expedient for his purpose to use a flat die, would you say that exercise of the operator's independent judgment demonstrated his knowledge and faithful zeal in the execution of his order, or would you think it, on the other hand, an indication of his ignorant conceit?

Ans. It would depend largely, if not wholly, on how the job turned out. If the result were satisfactory I should not be likely to inquire what tools were used. If, on the other hand, he spoiled the work by his departure from instructions, I should consider that he did not know his own business and did not know enough to follow the instructions of one who did.

Cross-int. 122. Do you not consider the drawings of the Mead patent as a part of the patent?

Ans. I do.

Cross-int. 123. Do you not find in those drawings that the
122 hole in the fabric is represented of substantially the same size as the barrel of the eyelet?

Ans. I do.

Cross-int. 124. Do you not find that the fabric is moulded to conform to the shape of the back of the socket?

Ans. I do.

Cross-int. 125. Can such moulding take place without a stretching of the fabric within the circle bounded by the margin of the disk E, as shown in the drawings?

Ans. It cannot.

Cross-int. 126. Will you please add together ten and ten and tell me whether they make less than twenty?

Ans. I will. They do not.

Cross-int. 127. Do you understand that in these things which you have produced and which you have called "Defendant's Exhibit Sample Fasterners Now Made under the Mead Patent," when they are applied to a fabric have the burr of the rivet inside of the socket in a plane nearer to the inside surface of the centre of the button head than the plane in which the outer lower edge of the button head lies?

Ans. As a general thing, they have the burr nearer. It would usually be above, but the neck is long enough to make an effective flange below the lower edge of the button cap, and this might possibly occur if the fastener were attached to very thick unyielding material.

Cross-int. 128. Such a fabric as you have imagined in your last

answer would be thicker and heavier than the fabric in either of the Defendant's Exhibits Kraetzer Fasteners Cross-cut in Leather and Kraetzer Fasteners with Large Hole in Leather?

Ans. It would.

Cross-int. 129. Which of the samples of leather in the exhibits just shown you do you call glove leather?

Ans. I do not know whether or not the term is technically appropriate to any special kind of leather. I should think that all, except, possibly, the black sample, are of a kind sometimes used in gloves. The light and tan-colored samples were chosen as being of about the same thickness and texture as that used in the ex-
123 hibit shown me by complainant's counsel as illustrating the formation of a mamelon.

Cross-int. 130. Do you understand that the Kraetzer fasteners are customarily attached to fabric in the manner shown in the exhibit just shown you?

Ans. If by the manner of attaching you include the punching of the hole in the leather or make the size of the hole a part of the manner I do not. I think they are usually applied through a hole not much, if any, larger than what is required to receive the riveting neck of the socket piece. The manner, however, of applying the fastener to the leather and clinching the parts together are, as I believe, the same in attaching the fasteners of those exhibits as is generally practised in attaching the Kraetzer fastener. The exhibits were attached by me for the purpose of showing that if the bringing of the leather close around the attaching tube or moulding the leather over the back of the socket piece were a part of the Mead invention or were essential to and a necessary feature of the use of the Mead structure, there is no necessity of the employment of these features or either of them in connection with the Kraetzer structure.

Cross-int. 131. Will you please show me in the Dowler patent the drawing or instruction which led you to attach the Exhibit Dowler Fastener Leather Over Back of Socket or to punch the hole in the leather of the Exhibit Dowler Fastener Unattached Small Hole in Leather of the size which there appears rather than of a size twice as great in diameter?

Ans. There is no instruction or drawing in the Dowler patent that led me to do those things. I merely did so to illustrate the fact that the Dowler structure is perfectly capable of being applied with a hole of the size used in the exhibits.

Cross-int. 132. I hand you an envelope on which is printed, among other things, "Hawley, Folsom & Martin, jobber- and manufacturing of men's furnishing goods, 27 and 29 Otis and 106 and 108 Arch street, Boston," and I ask you if it is sealed.

Ans. It appears to be sealed by gum, and the clasp-fastener apparently has not been opened since it was originally fastened through the paper outside of the envelope.

124 (The magistrate identifies the envelope with his initials; also the paper upon the outside.)

Cross-int. 133. Will you please detach the paper and open the envelope and state what the contents are?

Ans. I do so. It contains a pair of stock gloves; buckskin, I should think, lined with wool. They are provided with Kraetzer fasteners.

(The magistrate identifies the gloves by writing his initials on each.)

Cross-int. 134. Will you please saw off the side of one of the button heads of the left-hand glove?

Ans. I have done so.

Cross-int. 135. Please state whether or not the leather on that exhibit does not appear to cover the whole side of the socket up to the bottom of the centre of the button head.

Ans. It does appear to cover the socket up to the edge of the central hole in the button head.

Cross-int. 136. It also appears to be moulded up to conform to the shape of the back of the socket, does it not?

Ans. It is rounded up over the back of the socket, but hardly into conformity therewith.

Cross-int. 137. The hole in the leather in that case appears to be a little larger than the neck of the socket, does it not?

Ans. I can hardly tell. It can easily be pulled away from the neck of the socket, but I should not think that it was originally made much larger than the neck of the socket.

Cross-int. 138. I hand you a pair of gloves which the magistrate has also identified with his initials, the right-hand one of which has one of the two buttons cut open, and I ask you if the fasteners on those gloves appear to be Kraetzer fasteners.

(Question objected to and witness is forbidden to answer the question.)

Ans. In view of the statement of defendant's counsel I refuse to answer until instructed to do so by the court.

(Complainant's counsel moves to strike out the direct examination of this witness. No reason for the objection having been alleged and no authority existing anywhere for the arbitrary act of the counsel upon the other side, complainant's counsel rests.

125 Counsel for defendant replies that the reason for the instruction given the witness is obvious, as, in addition to the immateriality of the question asked, it is improper at this stage of the case to attempt to introduce fasteners as made by the defendant which were not referred to on complainant's *prima facie* case.)

JOS. P. LIVERMORE.

Attest: ALBERT E. LEACH,
Special Examiner.

Deposition of Albert G. Mead.

Direct examination by W. B. H. DOWSE, Esq., of counsel for defendant:

DEC. 28, 1888.

Int. 1. Are you the same Albert G. Mead who previously, on Feb. 7, 1888, was sworn in this case and gave testimony as set forth on pages 43, 44, 45, 46, and 47 of this printed record?

Ans. I am.

Int. 2. Are you the Albert Galatin Mead mentioned in complainant's Mead patent No. 325,688?

Ans. I am.

Int. 3. I find in the patent last referred to, No. 325,688, you have stated, on pages second and third, that "the disk E may be a flat plate. In lieu of finishing the socket portion of the fastening in the manner above described, a capped eyelet may be employed, * * * since by this method the cost of the finished article is somewhat lessened." Will you please explain your meaning?

Ans. I would answer that I have made models to show the meaning of the language in the patent specification, which show the different modifications which I described, but did not show in the drawings. The exhibit marked "Defendant's Exhibit Mead Modification No. 1" shows one application where the disk E is a flat plate with a filling of leather or paper back of the eyelet to prevent the defacement of the cap when the two parts are pressed together and the eyelet is set and to keep the plate flat. The filling is partly to give the button form to the cap and to retain it in that form.

126 Defendant's Exhibit Modification No. 2 shows the flat plate without the cap, as it would be if made as in Fig. 12, where no cap is shown.

Defendant's Exhibit Mead's Modification No. 3 shows the fastening in the form of a capped eyelet, as mentioned on page 3 of my patent, where it commences, "in lieu of being made as shown and described in Fig. 2."

Int. 4. You personally, as I understand you by your last answer, made the three exhibits marked "Defendant's Exhibit Mead's Modification Nos. 1, 2, and 3," referred to in the last answer. Am I right?

Ans. I did.

Int. 5. You have spoken of the use of a filling. Will you please state whether the use of filling in the button-hole member of the glove fastening was a well-known expedient of keeping the parts of the button-hole member in shape and in proper position at the date of your invention described in your patent No. 325,688?

Ans. It was.

Int. 6. Did you contemplate in describing your invention as set forth in complainant's patent No. 325,688, in the attachment of the fastener to the fabric, any stretching of the leather or any effect

other than is produced when two parts are fastened together by an eyelet?

Ans. I did not.

Int. 7. Did you contemplate in describing your invention as set forth in complainant's patent No. 325,688, in the attachment of the fastener to the fabric, that the hole in the fabric should be limited to any particular size?

Ans. I did not.

Int. 8. Will you please state whether or not it is possible to always make the hole of the same relative size in attaching the fastener shown in complainant's patent No. 325,688 to the fabric, and give your reasons for any opinion you may express or what your experience has been?

Ans. The size of the hole would depend on the material to which it is fastened. On soft material, with a small hole, it would readily conform to the parts between which the material is held, while in thick or stiff material it would be necessary to make the hole
127 materially larger, as the thick or stiff material would not stretch or conform to the two parts of the fastening.

Int. 9. Will you please state, if you know, what appearance the fabric has when a thin but somewhat brittle or hard fabric is in use when the cap is nearly semispherical, as shown in Fig. 2 of your patent No. 325,688, and a small hole is used, as shown in that figure?

Ans. It would conform in a measure to the form of the two parts of the fastening. It would depend on the brittleness of the material when it could be forced into the shape or be broken or wrinkled.

Int. 10. Did you contemplate the use of any other socket than the one you show in the drawings of your patent No. 325,688—I refer to the particular part D, socket portion?

Ans. I do not know that I did at the time, though I know of other forms that might be used, and, if so formed, have to be fastened in the same manner.

Int. 11. Have you read over and do you understand English letters patent No. 795 of 1883, marked "Defendant's Exhibit Dowler Patent," and do you understand the same and the construction therein shown?

Ans. I have and do.

Int. 12. Will you please examine the exhibits I now hand you and state what you know about them—that is, who, if you know, made them?

Ans. They are all models made by myself showing some modifications of the Dowler patent, as I understand it. I would say that one of the exhibits is not exactly as described in the Dowler patent. This is marked "Defendant's Exhibit Dowler Fastener, No. 795 of 1883." This exhibit shows two models. The one which I refer to is the one next to which I have attached a tag with my name on it. This I made to represent the one as shown in Fig. 19 of the Dowler patent, and afterwards noticed that this was intended to be fastened to the material by sewing on. Instead of being shown, the model does show it as described in the specification on page 5, line 15.

Int. 13. These exhibits of the Dowler fastener, as I understand you, which you have made, as you have stated, substantially show the construction as given in Fig. 3 of the Dowler patent and
128 the modification thereof described on page 5, in lines 14, 15, and 16. Am I right?

Ans. Yes.

Cross-examination by THOMAS W. CLARKE, Esq., of counsel for complainant:

Cross-int. 14. Did you make, before applying for your patent No. 325,688, of Sept. 8, 1885, any model or embodiment of the devices shown in said patent?

Ans. I did.

Cross-int. 15. What became of those models?

Ans. I believe one of them is in existence now in the possession of Mr. Dowse. The other models I might have made in experimenting, which I could not produce at the present time.

Cross-int. 16. Did you deliver any models of the device to your vendees when you sold your patent?

Ans. I don't remember that there were any called for or that I did deliver any.

Cross-int. 17. Are you sure you did not?

Ans. I might have given a model or something showing the way it was made. My recollection is not distinct in regard to it. My recollection is that I delivered all that was required.

Cross-int. 18. Did you, at the time you were negotiating for the sale of the patent, show any model to the purchaser?

Ans. This model I have mentioned, I stated that I supposed it to be in the possession of Mr. Dowse, was shown.

Cross-int. 19. Had you at the time you applied for your patent made a model substantially like Defendant's Exhibit Mead Modification No. 1?

Ans. As I recollect, the first or about the first form I made was substantially the same as the exhibit.

Cross-int. 20. After you had made this first form you concluded to have the button head more curved, did you not, as shown in the drawings of your patent?

(Question is objected to as leading and as attempting to elicit not facts, but a conclusion or result desired by complainant's counsel.)

Ans. I produced several forms and this was one of them. I don't say it was the first or the second.

129 Cross-int. 21. You mean by this the form illustrated in your patent?

Ans. That was one of the forms. There are two forms shown in the patent in regard to the construction. I would say that the forms are the same but differently put together.

Cross-int. 22. Were the forms shown in the drawings of the patent devised by you before or after the forms were devised which are shown in the Mead Exhibit Modification No. 1?

(Question is objected to as already put and answered in cross-int. 19 and answer thereof.)

Ans. I think I have previously stated I did not know which were first formed; they were devised about the same time.

Cross-int. 23. Did the first form devised and made contain between the disk, called in your patent E, and the button head a filling of leather board or other material?

(Same objection as to previous question.)

Ans. As I have previously stated, I do not know which were made first or devised.

Cross-int. 24. And you distinctly swear that one of the forms made before you applied for your patent did contain, under the button head and between it and the fastening eyelet, a filling of leather board or other material, do you?

(Same objection.)

Ans. As I have previously stated, this form was made before the application for the patent.

Cross-int. 25. And was made with the leather board or other filling; do you mean that?

(Same objection.)

Ans. That is what I have previously stated and maintain at the present time.

Cross-int. 26. And swear to it?

Ans. I will state to the counsel that I am under oath and state to the best of my recollection and belief.

Cross-int. 27. Well, now, will you please swear whether you did or did not make a fastener with a leather-board filling between the eyelet and the button head before you applied for your patent?

(Question is objected to for reasons already stated.)

130 Ans. Before answering this I should like information from the counsel what peculiar form and what words I shall use in swearing, as I have answered the question previously to the best of my ability.

Cross-int. 28. Select your own words for your own answer, but don't refer to anything you said before.

Ans. I have said I do not understand what he means by swearing in the previous interrogatory.

Cross-int. 29. Did you when you sold or applied for your patent explain that the employment of a leather-board filling between the eyelet and the button head was a desirable embodiment of your invention?

Ans. My recollection is that it was explained in order to protect the cap from being defaced by pressing the eyelet down to fasten the two parts together and prevent its marking, or, as I have stated, defacing the cap by the pressure caused by setting the eyelet on the dies supporting the cap.

Cross-int. 30. Please look at the piece of leather having some metallic attachments made to it, which is marked "A. G. Mead, December, 1884," now shown you, and say if you ever saw that before.

Ans. I would say that I have seen this or one very much like it, and recognize the parts on the leather as what I made or something like them, and I think it is samples I gave the Ball and Socket Fastener Company about the time that I sold the patent.

Cross-int. 31. Is there any leather-board filling in those samples?

Ans. In one of the samples I think there is, as near as I can distinguish; in the other there is not.

Cross-int. 32. Which one has the leather-board filling, the one nearest the capital D, the one nearest the Fig. 4, or the one on the same end as the Fig. 4, but farther from it?

Ans. The one I refer to as having a filling is nearest to the Fig. 4.

Cross-int. 33. That leather-board filling is perforated in the centre so that you see metal through it, or is it faced with metal, isn't it?

Ans. It is.

Cross-int. 34. Well, which is it, perforated or faced?

Ans. As I understand the question the leather board is perforated.

Cross-int. 35. What is the contrivance shown on the end
131 nearest the large D of this sample you have just seen, an illustration of a ball or an illustration of a socket?

Ans. It might perform the functions of either if it was not jammed and in the shape it now is.

Cross-int. 36. What did you intend it a sample of, if you remember?

Ans. I think it is intended to show that it might be fastened with an eyelet without a cap.

Cross-int. 37. Was it not made to illustrate the thing represented in Fig. 17 of the Richardson patent No. 276,714 of May 1, 1885?

Ans. It has the appearance of Fig. 17, but I cannot say at the present time whether I put that on there or whether or not it was intended to represent Fig. 17 shown in the Richardson patent.

Cross-int. 38. Do you remember whether in your negotiations with the Ball and Socket Fastener Company for the sale of your patent the Richardson device just shown you was a subject of conversation?

Ans. I do not remember.

Cross-int. 39. Do you remember how this invention of yours was brought to the attention of the Ball and Socket Fastener Company—that is, whether you brought it to their attention or whether they heard of it from some other source and came to you about it?

Ans. I can say that I showed it to them, but do not know that they knew of it or not before my showing it to them.

Cross-int. 40. When you showed it to them you made a proposition to them for its sale, did you not?

Ans. My recollection is that I did not.

Cross-int. 41. The proposition for its purchase came from them, then?

Ans. As I remember it.

Cross-int. 42. You agreed upon a price, did you not?

Ans. I did.

Cross-int. 43. Was that price paid you as agreed?

Ans. It was.

Cross-int. 44. After the price had been once fixed it was raised, was it not?

Ans. There was a different figure made after the first talk.

Cross-int. 45. A higher figure, was it not?

Ans. Yes.

132 Cross-int. 46. In preparing your specification for a patent, as I understand your testimony, you thought your invention was equally embodied by the structures of the form represented in Mead modification No. 1 and Mead modification No. 2, assembled as shown in those two exhibits, as it was in the structure shown in the drawings of your patent, Figs. 1, 2, 4, and 12, put together as shown in those drawings. Am I correct in this?

Ans. I consider the modifications as represented by the drawings.

Cross-int. 47. Will you please try to carry your mind back to the time when you applied for your patent, and which you sold to the complainant, and answer the question which I shall ask you referring to that period of your life?

Ans. I will answer any question you may ask that I can answer.

Cross-int. 48. At the time when you prepared your specification for a patent did you or did you not think that your invention was as well embodied by a structure of the form represented in Mead modification No. 1 and Mead modification No. 2 as it was in the forms illustrated in your patent at Figs. 1, 2, 4, and 12?

(Question objected to as answered by cross-int. 46 and answer.)

Ans. Yes.

Cross-int. 49. Did you consider that those forms called Mead modification No. 1 and Mead modification No. 2 were commercially or structurally as good as the form represented in the patent?

Ans. No.

Cross-int. 50. Did you consider that the forms of Mead modification No. 1 and Mead modification No. 2 were as new as the form illustrated in your patent?

(Objected to, as the specification of the Mead patent answers this question, and as this witness would be at this time disqualified to deny or to affirm whether any of the various forms described either in the drawings or in the specification, or both, are new or not new. It is submitted that this witness cannot be called upon to contradict the oath made and signed by him on the eighteenth day of December, A. D. 1884, which is attached to the Defendant's Exhibit File-wrapper and Contents, No. 5.)

Ans. I don't think I understand what is meant by being as new

as the other. I don't think I could give an answer, as they were all produced at the same time, as I have previously stated

133 Cross-int. 51. Did you know on or before the 8th of September, 1885, of the Richardson patent of May 1, 1883, No. 276,714, and had your attention been called before September, 1885, to a structure substantially like that of Fig. 17 of said Richardson patent as a structure described previous to the time when you sold your patent to the Ball and Socket Fastener Company?

Ans. I have no distinct recollection of this cup as referred to Fig. 17, but know it to be the general form of cup used in the Richardson patents with the arm broken off. I think very likely I did. I have no distinct recollection of this Fig. 17, but I knew there was a cup like it in the Richardson patent.

Cross-int. 52. And do you also think that you knew that that cup "like it" had been applied to a fabric by a central-fastening eyelet instead of on the end of an arm?

Ans. My recollection is not distinct in regard to it. I think I might have seen it.

Cross-int. 53. So far as your recollection goes, is it a recollection that you did see it or a recollection that you did not see it?

Ans. I am in doubt whether I saw it or not as applied to a fabric.

Cross-int. 54. You have no doubt, have you, that you knew a cup like it had been shown in the Richardson patent as capable of attachment by a central-fastening eyelet instead of a lateral arm?

(Objected to as already answered.)

Ans. I have no doubt of it as it had been done.

Cross-int. 55. You have no doubt, have you, that you knew that it had been done or proposed to be done before you applied for your patent?

(Objected to as indefinite and as the specification and drawings of the Mead patent, as sworn to by the witness on the eighteenth day of December, 1884, show what the witness had in mind as new with himself was and as he is disqualified now from in any way contradicting this statement.)

Ans. I am still in doubt whether I have seen it applied in that state or not.

Cross-int. 56. Please hear the question read and answer that part of it relating to "proposed to be applied."

Ans. I could not answer any different with regard to "proposed to be done."

134 Cross-int. 57. Did you know whether or not the fabric enclosed between the disk E and the back of the socket in the forms of fastener illustrated in the drawings, Figs. 1, 2, and 12, of your patent could assume the appearance therein shown without stretching?

Ans. I should say not with a small hole in the fabric and shown as the drawings describe.

Cross-int. 58. Did you contemplate the employment of a hole in the fabric for the attachment of your fastener to it as large as the largest diameter of the socket member?

Ans. I don't think at the time I considered that point particularly. I made the hole suitable for introducing the eyelet.

Cross-int. 59. Do you think that if the hole in the fabric was as large as the largest diameter of the socket member the socket *d* would be maintained in close connection with the fabric?

Ans. It would not, for the socket would slip through the hole.

Cross-int. 59½. Then did you not contemplate that the hole in the fabric should be smaller than the largest diameter of the socket?

Ans. Yes; that is self-evident.

Cross-int. 60. Did you consider that the engagement between the fabric and the parts of the fastener would be better with a hole as large as it could conveniently be made or as small as sufficient to allow the passage of the barrel of the eyelet?

(Question is objected to as already answered by the witness on his direct examination.)

Ans. That would depend on the material to which the fastening was applied.

Cross-int. 61. Take, for instance, the illustrations which you have produced, Mead modification No. 1, Mead modification No. 2, and Mead modification No. 3, and say whether the leather of those exhibits is the kind of fabric in which it would be desirable to make the hole as large as possible or of no greater size than sufficient for the passage of the barrel of the eyelet when using the forms of fastener illustrated in Figs. 1, 2, and 12 of your patent.

Ans. In Exhibit No. 3, Mead modification, it would be better to make the hole as small as would be necessary to enter the eyelet. In Exhibits Nos. 1 and 2 I should think that it would call for holes to be slightly larger.

135 Cross-int. 62. Say as large as half the difference between the diameter of the eyelet and the largest diameter of the socket, or more than that or less than that.

(Objected to as already answered.)

Ans. Less.

Cross-int. 63. What thin but somewhat brittle or hard fabric had you in mind when you answered Int. 9?

Ans. I had in mind some stock that I had seen in gloves, I supposed sheepskin, that would not stand a great deal of stretching without tearing or breaking.

Cross-int. 64. Among all the specimens of leather with fasteners attached before you can you pick out any that is a fair sample of that sort of material?

(Objected to as an unfair question. It does not appear what samples are before the witness, and as a matter of fact there must be some fifty to one hundred samples in all in the case and there are only some six or seven samples before the witness.

The magistrate is requested to note that the samples before the witness when the question was put were Mead modification No. 2, Mead modification No. 3, and Mead modification No. 1; Defendant's Exhibit Dowler Fasteners Unattached, Small Hole in Button; Defendant's Exhibit Kraetzer Fasteners, Cross-cut in Leather; Defendant's Exhibit Dowler Patent, Leather Over Back of Socket; Defendant's Exhibit Kraetzer Fasteners with Large Hole in Leather; Kraetzer Exhibit No. 1; Defendant's Exhibit Dowler Fastener, No. 795 of 1883, and the same being conformable to fact it is so noted.)

Ans. I do not see any in the samples shown me.

Cross-int. 65. Will you please state whereabouts in the Dowler specification or drawing you find illustrated or described the thing shown in the Defendant's Exhibit Dowler Fastener Unattached, Small Hole in Leather?

(Objected to, as question is already answered in answer to Int. 13.)

Ans. In Fig. 19 of the drawings, and described on page 5, lines 14, 15, and 16, which says that the strengthening ring of the cup can be dispensed with. Fig. 19 is not shown as representing the sample referred to. It shows it nearer than any other, the cup without the strengthening ring. One is shown in Fig. 3 of
136 the drawings. One of the two fastenings on the sample shown is found in Fig. 3, and the other is described on page 5 of the specification.

Cross-int. 66. Both the fasteners in the exhibit have the dome-shaped cap *k* of Figs. 3 and 4 of the Dowler patent, do they not?

Ans. Yes.

Cross-int. 67. Fig. 19 does not have this dome-shaped cap *k*, does it?

Ans. It is not shown in Fig. 19.

Cross-int. 68. The hole punched in the leather to receive the cup *b* of the Dowler patent is in Figs. 3 and 4 and all the other figures in which the union of the cap *k* and the cup *b* are eyeleted together at the summit of the dome, a hole large enough for the passage of the dome or cup *b* to its base, and not large enough for the passage of the ring b^3 or flange b^2, isn't it?

Ans. Yes.

Cross-int. 69. Is there any other description of the method of assembling the part- where they are united together by riveting to the top of the dome contained in the Dowler patent than this, "the dome or cup is passed through a hole in the material so that its ring b^3 bears on the under side of the material. The dome or cup *b* on the under side of the material is then covered with a dome-shaped cap, *k*, the upper edge of which is eyeleted around the dome or cup *b*, as seen in Figs. 3 and 4 and marked *l*. By the eyeleting of the cap *k* the material is griped between the base of the said cap *k* and the ring b^3 at the mouth of the dome or inverted cup *b*," and, if so, what is it?

Ans. I do not find any in the specification other than what is quoted.

Cross-int. 70. In the Exhibit Dowler Fastener Unattached, Small Hole in Leather, is it possible, with the hole as it is shown, for any portion of the dome or cup, which represents the part *b* of the Dowler drawings, to be above the leather at the point where it is eyeleted to the dome which represents the part *k*?

Ans. It doesn't appear above.

Cross-int. 71. In order to attach the Dowler fastener to a piece of fabric as Dowler indicated in the quotation which has been
137 read to you it would be necessary, would it not, to punch a hole in the leather of at least three times the diameter of the hole shown in the exhibit?

(Question is objected to as tending to undervalue the exhibit in question, which was offered by Mr. Livermore for the simple purpose of showing what the Dowler fastener was capable of in the hands of any manufacturer of experience.)

Ans. It would, to correspond with the specification as quoted as shown in the exhibit.

Cross-int. 72. When did you first become acquainted with the Dowler fastener?

(Question is objected to as immaterial, in view of the fact that the Dowler patent was issued long prior to the alleged invention as shown in Complainant Mead Patent.)

Ans. I do not recollect; it was within two years.

Cross-int. 73. Please look at the sample now shown you and say whether or not it is the same sample which was identified by you in answer to cross-int. 30.

Ans. It appears to be the same and I think it is.

Cross-int. 74. Have you any doubt about it?

Ans. I have not.

(Sample has attached to it a tag marked with the title of this case and the words "Sample shown Mead at cross-int. 30.")

Cross-int. 75. With how great a degree of certainty or uncertainty do you conjecture the presence of leather board in the sample nearest Fig. 4?

Ans. Knowing that I made samples about the time that I suppose I made the sample as exhibited, and the appearance of the dome shape being more full, leads me to think that there is a filling, although I cannot determine the fact by a thorough examination.

(Adjourned.)

DEC. 31, 1888.

Direct examination resumed:

Int. 76. The exhibits of the Dowler fastener referred to by you in your answer to Int. 13 were "Defendant's Exhibit Dowler Fastener, No. 795 of 1883, British," "Defendant's Exhibit Dowler
138 Fasteners Unattached, Small Hole in Leather," "Defendant's Exhibit Dowler Fastener, Leather Over Back of Socket," were they not?

Ans. Yes.

Int. 77. Are you the same Albert Galatin Mead to whom was granted United States letters patent No. 325,430, dated Sept. 1, 1885, the application for which was filed Dec. 5, 1884, and is there or not in this patent shown a centrally perforated leather filling?

Ans. I am and there is.

Int. 78. What was the purpose of the leather filling in this case?

(Objected to as new matter.)

Ans. To keep the cap from being bent out of shape when the eyelet is being forced on to the plate in attaching the button to the material; also to keep the back of the button or plate in shape under pressure.

Int. 79. Will you please state whether or not you ever saw or knew of the Richardson patent which has heretofore been referred to, No. 276,714, dated May 1, 1883, before the date of your patent No. 325,688, to wit, Sept. 5, 1885? I do not refer to the fasteners simply shown in the first sixteen figures of the patent, as I understand from the testimony previously given by you that you made for Mr. Richardson dies for producing a fastener of the character shown in the first sixteen figures, namely, a ball on the end of a horizontal arm and a cut at the end of a horizontal arm, such as is shown in the Richardson patent, No. 260,050, of June 27, 1882. I confine our inquiry simply to this particular patent No. 276,714.

Ans. I have no recollection of seeing or knowing of the modified form shown in Fig. 17 previous to the application of my patent above mentioned.

Int. 80. Have you any recollection of seeing or knowing of the patent itself?

Ans. I have not. I might have seen a report of the patent, but not a copy of the patent.

Int. 81. Do you have any recollection about the small device attached to the piece of leather referred to in your answer to cross-int. 30, which you said might perform the functions either of a stud or of a socket?

Ans. I do not.

139 Int. 82. Can you now say whether that was attached by you to the leather in December, 1884, or not, or whether it was ever seen by you prior to the time the piece of leather referred to was shown you at your last examination?

Ans. I have no recollection of it, therefore don't know.

Int. 83. You say the proposal of the purchase, as you remember it, of your patent No. 325,688 of the plaintiff came from them. Was the price which you received from them for the patent talked over at two different times? Will you explain this?

Ans. As I remember it, the matter was talked over at night and the papers were made out the next day, but in the meantime the extra price was mentioned and agreed to.

Int. 84. Will you explain what the original consideration was, what the extra price and consideration was, and how you came to

ask for it, and whether or not the plaintiff was perfectly willing to give it to you?

Ans. The first proposition was ten shares of stock in the Ball and Socket Fastener Company, five hundred dollars par value. The additional consideration was one hundred dollars in money. After considering it overnight caused the extra amount, and, as far as I know, was willingly allowed.

Int. 85. The only cash, then, as I understand, that you received for your invention was one hundred dollars?

Ans. That's all. The parties buying the patent were at the expense of taking out the patent.

Int. 86. Why after considering the matter overnight did you ask for some cash as a part of the consideration of the sale of your patent?

Ans. As I thought it nothing out of the way that I should receive some cash.

Int. 87. Why?

Ans. I thought it was its value.

Int. 88. Had you any doubt about the value of the balance of the consideration?

Ans. I knew the value of the cash, but not the value of the stock.

Int. 89. Are you the holder of this stock at the present time?

140 Ans. I am not and never have held it. The stock was made over to Emeline S. Mead, my wife, and she holds it now, to the best of my knowledge.

Int. 90. Who of the Ball and Socket Company were present and had a conversation with you relating to this sale of your patent?

Ans. Mr. Dumaresq, Mr. Richardson, and Mr. Chase.

Int. 91. Was it the William S. Richardson mentioned in letters patent No. 276,714, that has been referred to?

Ans. It was.

Int. 92. Were each and all of these parties present at the evening of the day before the sale and also on the day of the sale?

Ans. They were all present in the evening before the sale, and I think Mr. Dumaresq was absent the next day.

Int. 93. Do you remember to whom you first showed the sample fastener which you sold as above?

(Objected to as new matter.)

Ans. I don't remember. I think very likely to some of the men in the shop.

Int. 94. I refer to the three parties you referred to—Mr. Chase, Mr. Richardson, and Mr. Dumaresq.

Ans. Mr. Chase, I think.

Int. 95. Did Mr. W. S. Richardson examine carefully the sample with the fasteners on it which he has produced here and which he now has in his possession, marked "A. G. Mead, December, 1884"?

Ans. I don't remember when that particular sample was presented to the parties.

Int. 96. Did you have a sample in your various talks with the

Ball and Socket Company prior to the sale when Mr. Richardson was present?

Ans. I did.

Int. 97. And did Mr. Richardson carefully examine this sample?

Ans. Yes.

Int. 98. Will you please state whether the fastener which I now hand you is a sample of the fastener shown and described in your patent No. 325,430, with leather board contained therein?

(Objected to as new matter.)

141 Ans. It is.

(Defendant's counsel produces fastener, and the same is marked "Mead Fastener of Letters Patent No. 325,430, A. E. L., sp'l ex'r.")

Cross-examination resumed:

Cross-int. 99. Do you know whether any money dividends have been paid on the stock of the Ball and Socket Fastener Company which went to your wife in the trade which was made in your patent by them?

(Objected to as immaterial.)

Ans. I have seen checks and receipts sent to my wife from the Ball and Socket Fastener Company which I believe have been dividends on the stock.

Cross-int. 100. Have you observed those checks and receipts to have come along pretty regularly?

(Objected to as immaterial and indefinite.)

Ans. There have been communications from the Ball and Socket Fastener Company in my care, but I couldn't say that they all contained checks.

ALBERT G. MEAD.

Attest: ALBERT E. LEACH,
Special Examiner.

SEPT. 12, 1888.

It is stipulated by and between counsel for the respective parties that the evidence already taken for the complainant shall stand as the complainant's *prima facie* case, and that the issue taken on the plea shall stand as a replication to the answer, and that the evidence already taken by the defendant shall stand as a part of the defendant's evidence on the answer.

Counsel for defendant offers in evidence the following letters patent of the United States, viz:

No. 43152, dated Jan. 14, 1864, to F. E. Drake, and the same is marked "Defendant's Exhibit Drake Patent."

No. 8860, dated April 6, 1852, to D. Rait, and the same is marked "Defendant's Exhibit Rait Patent."

No. 42442, dated Dec. 28, 1858, to C. McIntire, and the same is marked "Defendant's Exhibit McIntire Patent."

142 No. 49305, dated Aug. 8, 1865, to R. B. Ruggles, and the same is marked "Defendant's Exhibit Ruggles Patent."

No. 53471, dated March 27, 1866, to F. I. Palmer, and the same is marked "Defendant's Exhibit Palmer Patent No. 1."

No. 53472, dated March 27, 1866, to F. I. Palmer, and the same is marked "Defendant's Exhibit Palmer Patent No. 2."

No. 88451, dated March 30, 1861, to I. Cole, and the same is marked "Defendant's Exhibit Cole Patent."

No. 3421 (reissue), dated May 4, 1869, to Somers and Atwood, and the same is marked "Defendant's Exhibit Somers and Atwood Patent."

No. 178,726, dated June 13, 1876, to C. N. Brown, and the same is marked "Defendant's Exhibit Brown Patent."

No. 155,383, dated Sept. 29, 1874, to A. E. Newcomb, and the same is marked "Defendant's Exhibit Newcomb Patent."

No. 180,938, dated Aug. 3, 1876, to Ernst Schnopp, and the same is marked "Defendant's Exhibit Schnopp Patent."

No. 203,308, dated May 7, 1878, to C. A. Wood, and the same is marked "Defendant's Exhibit Wood Patent."

No. 206,883, dated Aug. 13, 1878, to A. B. Kitson, and the same is marked "Defendant's Exhibit Kitson Patent."

No. 210,017, dated Nov. 19, 1878, to W. P. Dolloff, and the same is marked "Defendant's Exhibit Dolloff Patent No. 1."

No. 225,375, dated March 9, 1880, to L. Hill, and the same is marked "Defendant's Exhibit Hill Patent No. 1."

No. 222,400, dated Dec. 9, 1879, to L. Hill, and the same is marked "Defendant's Exhibit Hill Patent No. 2."

No. 230,115, dated July 20, 1880, to W. P. Dolloff, and the same is marked "Defendant's Exhibit Dolloff Patent No. 2."

No. 233,060, dated Oct. 5, 1880, to E. Wright, and the same is marked "Defendant's Exhibit Wright Patent."

No. 235,144, dated Dec. 7, 1880, to D. Essex, and the same is marked "Defendant's Exhibit Essex Patent."

No. 244,632, dated July 19, 1881, to E. Loewenthal, and the same is marked "Defendant's Exhibit Loewenthal Patent."

No. 241,767, dated May 17, 1881, to J. Whitby, and the same is marked "Defendant's Exhibit Whitby Patent."

143 & 144 No. 69959, dated Oct. 22, 1867, to J. Barclay, and the same is marked "Defendant's Exhibit Barclay Patent."

No. 260,050, dated June 27, 1882, to William S. Richardson, and the same is marked "Defendant's Exhibit Richardson Patent 260,050."

(Adjourned.)

SEPT. 14, 1888.

Counsel for defendant offers in evidence United States letters patent to Boeklen and Stachlen, No. 33025, dated Aug. 13, 1861, and the same is marked "Defendant's Exhibit Boeklen and Stachlen Patent."

No. 91308, dated June 15, 1869, to L. C. Chase, and the same is marked "Defendant's Exhibit Chase Patent."

No. 179,932, dated May 2, 1876, to L. C. Curran, and the same is marked "Defendant's Exhibit Curran Patent."

No. 60217, dated Dec. 4, 1866, to C. F. Mauvas, and the same is marked "Defendant's Exhibit Mauvas Patent."

No. 83403, dated Oct. 27, 1868, to C. N. Nickerson, and the same is marked "Defendant's Exhibit Nickerson Patent."

No. 117,916, dated Aug. 8, 1871, to C. A. Newton, and the same is marked "Defendant's Exhibit Newton Patent."

No. 47661, dated May 9, 1865, to S. S. Ritter, and the same is marked "Defendant's Exhibit Ritter Patent."

No. 54071, dated April 17, 1866, to C. Robitaille, and the same is marked "Defendant's Exhibit Robitaille Patent."

No. 187,442, dated Feb. 13, 1877, to H. S. Wing, and the same is marked "Defendant's Exhibit Wing Patent."

Attest: ALBERT E. LEACH,
Special Examiner.

145 *Evidence for Complainant in Reply,*

Taken pursuant to the sixty-seventh rule of the Supreme Court of the United States, in equity, as amended, before me, Stephen Thacher, special examiner.

BOSTON, *March* 27, 1889.

Present: Thomas W. Clarke, Esq., of counsel for complainant; W. B. H. Dowse, Esq., of counsel for defendant.

Deposition of Edward E. Quimby.

Direct examination by THOMAS W. CLARKE, Esq., of counsel for complainant:

Int. 1. What is your name, age, residence, and occupation?

Ans. My name is Edward E. Quimby; I am fifty-eight years of age; I reside in Orange, New Jersey, and I have my office in New York; I am a mechanical engineer, but have been chiefly occupied for many years in connection with patents as a solicitor of patents and an expert in patent causes.

Int. 2. What has been your experience and what have been your facilities for fitting yourself to testify as an expert in patent causes?

Ans. During a large part of my life I have been more or less intimately connected with various manufacturing enterprises. I have heretofore designed and superintended the construction and operation of machinery for various purposes.

I am familiar with patents and during the last thirty-five years I have been frequently engaged in investigations for determining the scope of patents and the extent of originality of alleged new inventions by comparisons of the various subjects of inquiry with prior patents and publications relating thereto respectively. During the same period I have drawn the specifications and claims of patents and have often been examined as an expert in patent causes and have been extensively occupied as an arbitrator in the decision of questions relating to inventions and patents.

146 & 147 Int. 3. Have you made some examination concerning the state of the art relating to glove-fasteners, or other

metallic substitutes for the ordinary button and button-holes, as it existed prior to the year 1885?

Ans. I have.

Int. 4. Have you read and do you understand the Mead patent, No. 325,688?

Ans. I have frequently read the Mead patent, and think I understand the same.

Int. 5. What do you understand to be the new thing shown in the drawings described in the specification, and particularly referred to in the fourth, sixth, and seventh claims thereof?

(Adjourned.)

MARCH 28, 1889.

Ans. I find that the Mead patent relates to a glove fastening of the type in which a socket affixed to the overlapping glove flap serves to receive and hold a knob affixed to and projecting laterally outward from the underlapping glove flap, whereby, when the glove is fastened upon the hand of the wearer, the only visible portion of the fastening has the appearance of a button applied to the exterior of the overlapping flap. The features of the Mead fastening particularly referred to in the fourth, sixth, and seventh claims of the patent inhere in the construction and manner of application of the socket portion of the fastening to the overlapping glove flap.

The socket portion is composed of a dished washer or shell recessed upon its under side and applied to the exterior of the glove flap, and a cup-shaped washer provided with spheroidally curved wings and applied to the interior of the glove flap and secured to the exterior washer or button head by a central rivet passing through a hole in the glove flap, which hole need not be any larger in diameter than the rivet is, and is hence permitted to be of much smaller diameter than the knob is.

The cup-shaped washer, with its wings curved slightly inward at their lower edges and thus presenting a contracted but outwardly yielding mouth, constitutes the spring socket for receiving and holding the knob.

Of itself this spring socket was not new, but was one of
148 & 149 a class of prior-existing glove-fastener sockets having spring mouths, adapted to yield to admit a knob and then to contract against the neck of the knob.

The new thing in the structure referred to in the fourth, sixth, and seventh claims of the Mead patent is that the spring-mouthed socket presses the glove leather upward into the button head and squeezes the leather against the inner surface of the button head.

This introduces into the connection an important element of strength, to wit, the friction which the glove flap encounters when being pulled against the lower edge of the button head around which it has been turned. It is so pulled when the glove is in use and the flaps are fastened to each other.

The principle involved is a familiar one. To illustrate it in a simple way I have prepared and now produce a wooden clamp,

between the two parallel faces of which I now slide a strip of flexible leather to which a small weight is attached. When the clamp is held so that its opposed faces are vertical the weight readily pulls the leather strip downward; but if the clamp be so turned that the leather strip draws across the edge of the lower face the weight and strip remain stationary. The added friction is such that a much heavier weight must now be attached to the strip before it will move.

Similarly in the Mead fastener the glove leather is so held within and against the interior of the button head that when the glove flap is pulled in the direction to which it is subjected to strain when the glove is in use it is drawn against and binds upon the lower edge of the button head, and thus encounters a degree of friction which greatly increases the amount of force required to dislodge it from its appropriate position in the button head.

The drawings show and the specification describes two modes of finish for the button head.

In that illustrated in Fig. 2 the button head is composed of the dished washer E covered by the imperforate cap F.

In that illustrated in Fig. 12 the imperforate cap is omitted and the button head consists simply of the dished washer E. In both cases the dished washer is necessarily present, because it is the thing which by being riveted to the spring-mouthed socket
150 & 151 serves to fasten the structure to the glove flap, the leather of which is squeezed by the exterior of the socket against the interior of the button head or dished washer E.

Claim 4 relates to the structure shown in Fig. 2 in which the imperforate cap F is employed.

The invention referred to in claim 6 is not limited to a combination employing the imperforate cap, but is present in a structure like that shown in Fig. 12, in which the socket on the inner side of the glove flap is by means of the rivet combined with the button head on the outer side of the glove flap, irrespectively of whether such button head be composed of a double shell, to wit, the dished washer E and imperforate cap F, as shown in Fig. 2, or of a single shell, to wit, the dished washer E, as shown in Fig. 12.

The seventh claim is limited by the condition that an annular depression shall be formed around the edge of the hole through the dished washer (which is called in the claim the "concaved collet or disk E"), the purpose of which depression is to contain the outwardly turned flange of the rivet, so that the outer surface of the rivet flange will be substantially flush with the outer surface of the dished washer, and the button head will thus be made to present smooth exterior surface.

(The clamp produced by the witness is offered in evidence in conjunction with the leather strip and weight and marked "Quimby Illustrated Model, Clamp, and Strip.")

Int. 6. Have you in stating the new thing described and shown in the Mead patent and referred to in the fourth, sixth, and seventh claims thereof taken into account the prior state of the art as illus-

trated in the various patents and documents introduced in evidence by the defendant herein?

Ans. I have.

Int. 7. Have you examined the various exhibits in this case marked "Glove with Kraetzer Fastener" and "Defendant's Exhibit Kraetzer Fastener," and do you understand the construction and method of application of those fasteners, and particularly the construction and method of application upon a fabric of the socket or button-hole portion thereof?

152 & 153 (Defendant's counsel admits that Complainant's Exhibit Glove with the Kraetzer Fastener, March 28, 1889, represents fasteners such as were made and sold by defendant before the bringing of this suit.)

Ans. I have examined the two exhibits referred to and understand the construction and method of application thereof. For the purpose of more fully examining the same, I have filed notches in some of the button heads of the exhibits, by which I am enabled to observe the mode of construction and method of application of the socket portion of the fastener to the glove leather.

Int. 8. Have you also seen fasteners of the character described in the Mead patent and such as are shown in the Exhibit Kraetzer Fastener applied commercially to gloves?

Ans. I have witnessed the application to gloves of glove-fasteners such as are described in the Mead patent and also of fasteners like the Kraetzer fastener, excepting that the button heads of those which I have seen applied commercially were composed of the double shell—that is, of what I have called the dished washer and of an imperforate cap covering the dished washer.

A sample of these which I have seen applied I herewith produce.

(Sample produced, offered in evidence, and marked "Kraetzer Fastener, Imperforate Cap.")

Defendant's counsel objects to the introduction in evidence of this exhibit, as there is no proof in the suit as to what fastener this is or who has either made, used, or sold the same, and also as entirely irrelevant and immaterial to the matter in issue, and notice is here given that so far as defendant's counsel knows this fastening has never been either made, used, or sold by this defendant.)

I have also seen upon gloves the Kraetzer fastener with the button head composed of a single shell and perforated to receive the rivet.

Int. 9. Please compare the devices shown in the Exhibits Kraetzer Fastener and Glove with Kraetzer Fastener with the contrivance shown and described in the Mead patent, and referred to in the fourth, sixth, and seventh claims thereof, stating their resemblances and differences, and say whether or not the said Exhibits Kraetzer Fastener embody the invention of the Mead patent referred to in the fourth, sixth, and seventh claims, and give your reasons for any opinion you may express.

154 & 155 Ans. I find that the socket portions of Defendant's Exhibits Kraetzer Fastener and Complainant's Exhibit Glove with Kraetzer Fastener, in respect of their construction and manner of application to the glove leather, employ what I have described as the new thing shown and described in the drawings and specification, and particularly referred to in the fourth, sixth, and seventh claims of the Mead patent, because the socket portions of all of the Kraetzer fasteners of the said exhibits are composed of a dished washer or button head united by a central rivet to a spring-mouthed socket, which in application presses the glove leather upward into the recess on the under side of the dished washer or button head.

A small hole through the glove leather permits the passage of the rivet, and the glove leather is squeezed against the inner surface of the button head by the exterior surface of the spring-mouthed socket. The button heads of the said Kraetzer fastenings are not provided with imperforate caps, and therefore, as I understand it, the said exhibits do not employ the invention referred to in the fourth claim of the Mead patent. They do, however, employ the invention referred to in the sixth claim of the Mead patent, because they employ in each case a hollow socket in combination with a rivet and button head, whereby the socket is centrally attached to the glove leather.

It is true that the Kraetzer hollow socket differs in form from the hollow socket exhibit in the Mead patent, and, instead of their being in the Kraetzer structure a separate rivet for fastening the internal socket to the external button head, the Kraetzer hollow socket is provided with a tubular extension which passes through a small hole in the glove leather, and is upset at its outer end into an annular depression formed around the edge of the hole through the button head. It is also true that instead of being provided with spheroidally curved wings like the socket exhibited in the Mead patent the Kraetzer socket is provided at its mouth with an annular recess for containing a divided ring adapted to yield laterally to admit the knob into the socket and to then contract against the neck or smaller part of the knob.

The differences in the form of the Kraetzer spring-mouthed socket to which I have thus called attention do not prevent the Kraetzer structure from employing the invention of the sixth
156 & 157 claim of the Mead patent, for the reason that in each of the socket portions of the Kraetzer fasteners the glove leather is pressed by the socket up, into, and against the recessed under side of the button head, so that when the fastening is in use the strain to which the glove flap is subjected draws it against the under edge of the button head around which it has been turned in the act of fastening the socket portion to the glove. Hence the Kraetzer fastening possesses the advantage of the Mead fastening in respect of the friction which the glove flap encounters in use by being drawn against and made to bind upon the lower edge of the button head around which it is bent.

The socket portions of all of the said Kraetzer fastenings employ

the invention referred to in the seventh claim of the Mead patent, because in each of them the button head is provided with an annular depression around the hole through it, in which depression the outer flange of the rivet is seated, as called for by the terms of the said sixth claim.

Int. 10. Mr. Mead, a witness called by the defendant, has testified that the Mead modifications, No. 1, No. 2, and No. 3, are models which show the meaning of the language in the specification. The Mead modification No. 1 has the disk E of the patent, a flat plate with a filling of leather or paper back of the eyelet to prevent the defacement of the cap and to keep the plate flat; the Mead modification No. 3 shows the fastening in the form of a capped eyelet, and the Mead modification No. 2 is an illustration which shows the flat plate without the cap, as it would be if made as in Fig. 12, where no cap is shown. Do you find in the Mead patent any of those three modifications illustrated in the drawings?

Ans. I do not.

Int. 11. Mr. Mead has also testified that the pieces of leather with metallic parts attached, marked "A. G. Mead, Dec., '84," were samples which he gave the Ball and Socket Fastener Company about the time that he sold them the patent, and, in his opinion, the one nearest the figure 4 has a leather-board filling, and probably the leather-board filling was perforated in the centre. Will you please examine that sample and say whether there is any leather-board filling?

Ans. I have caused the samples referred to to be cut
158 & 159 into so as to expose their interior construction. I do not find in either of them any such filling as is referred to.

Int. 12. Will you examine the sample which is nearest the figure 4, and say whether or not in that sample the disk is integral with the barrel of the eyelet which fastens the glove leather to the exterior of the socket, and whether it is concaved towards the socket?

(Defendant's counsel objects to the introduction in evidence of the sample referred to in Int. 12 at this time, and to the evidence relating thereto, as the sample was not offered in evidence and left in the care of the magistrate at the time it was shown to Mr. Mead, but was retained by the complainant in its own possession, and it does not appear that the sample is in the same condition it was when it was shown to the witness Mead.)

Ans. In the sample nearest the figure 4 the counterpart of the disk E is the wide outer flange of the eyelet or hollowed rivet by means of which the glove leather and socket are fastened together, and this wide flange is curved to correspond to the curvature of the external cap which encloses it. This construction is referred to in the sentence commencing on line 28 and ending on line 36, on 3 of the printed specification of the Mead patent, in which it is said that—

"In view of finishing the socket portion of the fastenings in the manner above described, a capped eyelet may be employed in which the cap of the eyelet may be extended to cover and enclose the disk E, in the manner shown in Fig. 2, as accomplished by the imper-

forate cap or button head F, since by this method the cost of the finished article is somewhat lessened."

Int. 13. Do you find in the specification of the Mead patent and referred to in the claim thereof any instruction to the artisan, in assembling the parts upon the leather of a glove, to leave the part which is called in the patent "the disk E" flat in the article as assembled upon the leather?

Ans. The specification states on line 104, page 2, that—

"The disk E may be a flat plate."

Commencing on line 116, page 2, instructions are given for assembling the parts, and after the statements in lines 126, 127, and 128 that—

160 & 161 "with a round-headed plunger the lower extremity of the eyelet *l* is swaged or pressed out laterally"—

it is further stated that—

"By this process the disk E approximates very nearly in shape the outside periphery of the button head, while between these two elements is retained the enlarged top of the eyelet *l*."

I think it is to be inferred from all this that what the patent calls the "disk E" is ultimately made to acquire a cupped or dished shape by the act of uniting the parts together.

Int. 14. Mr. Livermore, the expert witness for the defendant, has considered the Mead patent with relation to the state of the art as shown in the Schloss English patent, No. 1450 of 1870; the Bayer English patent, No. 809 of 1877; the Dowler English patent, No. 795 of 1883; the Schloss French patent; the United States patent to Whitby, 241,767, of May 17, 1881; the Richardson patent of May 1, 1883, No. 276,714, and the Richardson patent, 300,509, and I ask you if you are familiar with the said patents which were under consideration by Mr. Livermore.

Ans. I am.

Int. 15. Please compare the contrivance described and shown in the Schloss British patent, No. 1450 of 1870, with the contrivance shown in the Mead patent, and referred to in the sixth and seventh claims thereof, and with the contrivance of the Kraetzer fastener as you have considered it as an embodiment of the structure referred to by said claims of the Mead patent, and say whether or not the contrivance of the Schloss patent embodies the new thing described in the Mead patent and referred to in the claims in manner and form as it is embodied in the Kraetzer fasteners.

(Adjourned.)

MARCH 29, 1889.

Ans. The Schloss glove fastening is one of the type in which a socket secured to the overlapping glove flap serves as the receiver for a knob affixed to and projecting laterally outward from the underlapping glove flap. The socket portion is in two parts. The under member consists of a flat plate provided with an upwardly projecting tube screw-threaded on the inside. The upper

162 member consists of a concave or dished plate provided with a downwardly projecting tube screw-threaded on the outside.

These two members are fastened together and to the glove flap by screwing the upper tube into the lower tube after the lower tube has been inserted through a hole in the glove flap.

The glove leather lies flat upon the surface of the lower plate outside the tube, and the annular lower edge of the upper concave plate bears upon the top of the glove leather when the two plates are coupled together by the screwing home of the upper tube into the lower tube.

The lower plate has a hole in the middle made by slitting it radially from the centre and then bending the metal between the slits obliquely upward so that it may yield laterally to permit the knob to enter the tube. The knob itself is given the capacity of radial compressibility and resilience by being slit longitudinally for a portion of its length.

In comparing the Schloss fastener with the Mead and Kraetzer fasteners I observe, first, that the Schloss fastener requires a large hole to be made in the glove leather, a hole of much larger diameter than the diameter of the knob; secondly, that the glove leather is not turned upward into the concave upper member of the Schloss socket, and that there is nothing in the Schloss structure to hold the glove leather up in and against the concave surface of the concave plate. Hence the Schloss glove leather is not made to bind around the edge of the concave plate as it is in the Mead and Kraetzer fasteners, but, on the contrary, when pulled in the direction to which it is subjected to strain when in use the Schloss glove flap moves in a plane, which is parallel with the only two surfaces between which it is pressed, to wit, the lower edge of the concave upper plate and the top of the lower plate upon which the glove flap lies.

The socket portion of the Schloss fastener therefore does not exhibit the construction nor the mode of application to the glove which are peculiar to the Mead invention, and does not possess the advantages of the Mead invention.

For these reasons I am clearly of the opinion that the Schloss patent does not disclose the invention shown and described
163 in the drawings and specification and particularly referred to in the sixth and seventh claims of the Mead patent.

Int. 16. Please compare the contrivance shown and described in the Bayer English patent, No. 809 of 1887, with the contrivance shown in the Mead patent and referred to in the sixth and seventh claims thereof and with the contrivance of the Kraetzer fastener, as you have considered it as an embodiment of the structure referred to by said claims of the Mead patent, and say whether or not the contrivance of the Bayer patent embodies the new thing described in the Mead patent and referred to in the claims in manner and form as it is embodied in the Kraetzer fasteners.

Ans. The Bayer glove-fastener, although it belongs to the general type which I have described in respect of consisting of a socket secured to the overlapping glove flap for receiving a knob affixed to and projecting laterally outward from the underlapping glove flap, is a more decided departure from the class of glove-fasteners to

which the Mead and Kraetzer fasteners belong than the Schloss fastener is. Mead, Kraetzer, and Schloss make a single hole in the glove flap, through which is inserted the rivet or the screw by which the upper and lower members of the socket portion are secured to each other and to the glove flap. On the contrary, in the Bayer fastener what may be called the button head, which is what the Bayer patent calls the dome, is provided with two downwardly projecting tongues, which are inserted through two parallel slits in the glove lap and are then bent inward and upward around a split ring which serves as the spring mouth through which the knob is inserted, and which also serves as the lower member or key by which the upper member of the Bayer contrivance is held to the glove flap. When the Bayer fastening is in use it is subjected to strain in a direction which necessarily tends to stretch open the slits through which the tongues of the dome are inserted and to thus make gaps through the glove flap outside of the button head. There is nothing in the Bayer fastener to gripe or hold the glove lap between the place where strain is applied to it and the edge of the slit. This is, I think, a fatal objection in a practical point of view to the Bayer fastener, and in any event it is a feature which greatly differentiates the Bayer construction from that employed in the Mead and
164 Kraetzer fasteners. I observe that the spring ring used by Bayer, which yields to allow the entrance of the knob and then contracts against the smaller part or neck of the knob, resembles in its mode of operation the spring ring employed in the Kraetzer fastener. As there is no protection of the glove flap in the Bayer contrivance between the edges of the slits through which the dome tongues are inserted and the place outside the dome where the glove flap is subjected to strain, I am clearly of the opinion that the Bayer patent does not disclose the invention shown and described in the drawings and specification and particularly referred to in the sixth and seventh claims of the Mead patent.

Int. 17. Please compare the contrivance shown and described in the Dowler English patent, No. 795 of 1883, with the contrivance shown in the Mead patent and referred to in the sixth and seventh claims thereof and with the contrivance of the Kraetzer fastener, as you have considered it as an embodiment of the structure referred to by said claims of the Mead patent, and say whether or not the contrivance of the Dowler patent embodies the new thing described in the Mead patent and referred to in the claims in the manner and form as it is embodied in the Kraetzer fasteners.

Ans. The Dowler patent describes several forms of glove-fasteners, in some of which the parts are provided with prongs which are inserted through the glove leather and have their projecting points bent over for the purpose of holding the metallic structure to the glove. These need not be considered. Another form of constructing the socket portion of a glove fastening which is illustrated in Fig. 3 of the Dowler patent is the only one which is at all pertinent to the present inquiry. The outer member of the structure represented in Fig. 3 is what the Dowler patent calls a dome and is a cup-shaped metallic shell provided at the bottom with an outward

flange and provided in the middle with a downwardly drawn short tube which serves as an eyelet and has its lower end upset against the under side of another inverted cup, which is perforated at the top to permit the passage through it of the tube of the outer cup, which serves as the eyelet. The inner inverted cup is to serve as the spring socket. It is provided at the bottom with an outwardly projecting flange and has portions of its sides and flange cut
165 away in order that it may have some capacity of lateral expansion and resiliency. Its upper portion is of greater diameter than its lower portion in order that it may contain the upper part of a stud or knob having a slightly contracted neck.

According to the patent the flange at the bottom of the inner cup or spring socket may be seated in an annular recess formed on the inner side of a ring which bears against the under side of the glove leather immediately under the point of bearing of the flange of the dome or outer member of the structure upon the outer side of the glove leather. According to the patent, although it is preferred to cut away parts of the flange and sides of the inner cup or spring socket, yet the cup may be used without cut-away parts as represented in section and plan in Fig. 7, in which case the strengthening ring at the bottom may be dispensed with and the glove leather will then be griped directly between the flange of the dome and the flange of the inner cup. The Dowler contrivance requires that there should be made in the glove leather a hole of greater diameter than the diameter of the knob. The glove leather is not turned up into the dome and there is nothing in the Dowler structure to press and hold the glove leather up in and against the concave inner surface of the dome. In this case, therefore, as in the Schloss fastener there is no binding of the glove leather around the lower edge of the dome or button head and no griping of the glove leather except between surfaces the planes of which are parallel with the normal plane of the glove flap and hence parallel with the plane of direction in which the glove flap is subjected to strain when the fastening is in use. In these respects the Dowler contrivance differs radically from the glove-fasteners of Mead and Kraetzer, in which the glove leather is held up in and against the inner surface of the button head and is subjected to friction when the glove is in use by being made to bind against the lower edge of the button head. In view of these considerations I am clearly of the opinion that the Dowler patent does not disclose the invention shown and described in the drawings and specification and particularly referred to in the sixth and seventh claims of the Mead patent.

Int. 18. Mr. Livermore, the expert for the defence, has called attention to the Whitby American and Schloss French patents
166 with regard to the employment of a recess in the centre of the button head for the reception of the flange of the eyelet. Do either of these patents cited by Mr. Livermore show the new thing of the Mead patent described in the specification and referred to in the seventh claim in connection with the recess therein referred to?

Ans. They do not. The seventh claim of the Mead patent is of less scope than the sixth claim of the patent, by reason of its having

the limitation imposed upon it that there shall be formed in the button head an annular depression to receive the flange of the eyelet, so that the button head shall present exteriorly a smooth finish. The patent describes two ways of securing this smooth exterior finish—one by forming the depression in the button head to receive the eyelet flange, which is referred to in the sixth claim, and the other by covering the button head with an imperforate cap or what the patent calls the imperforate button head F, which in its general effect and mode of application resembles the brass caps which are sometimes applied to round-head nails for the purpose of improving the finish of their heads. According to my understanding, therefore, the fourth claim is a claim to the structure claimed broadly in the sixth claim, but having imposed upon it the limitation that an imperforate cap shall be employed, while the seventh claim is also a claim to the structure referred to in the sixth claim, but having imposed upon it the limitation that the button head shall be provided with an annular depression to receive the outer flange of the eyelet.

Int. 19. I call your attention to the diagrams introduced by Mr. Livermore and marked "Defendant's Exhibit Diagram Richardson Patent 300,508," "Richardson Patent 276,714, Fig. 17, and Mead Modifications," "Richardson Patent 300,509," "Richardson Patent 300,510," and "Mead Patent 325,688," and I ask you concerning the drawings on those diagrams which purport to represent the Kraetzer structure and its application to cloth or fabric, whether those representations are fair representations of the Kraetzer structure as introduced in evidence by the defendant himself in this case, and, if not, in what respect they vary therefrom.

I also ask you, with regard to the illustration of the Dowler structure contained in those diagrams, whether that is a fair representation of the structure described and shown in the Dowler patent.

167 Ans. The four Kraetzer diagrams produced by defendant's expert do not either of them fairly represent any one of the Kraetzer fastenings introduced in evidence in this case nor any Kraetzer fasteners which I have ever seen for the reason that the spaces between the concave faces of the button heads and the exterior surfaces of the sockets are very much wider than those spaces are, in fact, in the Kraetzer fastening and are so wide that the fabric or glove leather is loosely contained in them. As a matter of fact, in the Kraetzer fasteners themselves those spaces are so narrow that the glove leather fits closely in them. That one of the diagrams of the Dowler fastening which represents the strengthening ring applied to the flange of the spring socket is unfair and unlike what is shown and called for in the Dowler patent, because the ring is smaller in diameter than it is represented to be in the Dowler patent and because the upper surface of the ring is not parallel with and directly under the horizontal flange of the outer dome.

According to the Dowler patent, the glove leather is to be gripped between the flange of the outer cap or dome and the ring under-

neath, and it is shown to be so gripped in Figs. 4 and 8 of the Dowler patent.

Int. 20. The defendant has introduced in evidence some pieces of metal purporting to represent the device described and shown in the Dowler patent and have caused them to be marked "Defendant's Exhibit Dowler Fastener, No 795 of 1883, British," and also have introduced a model marked "Defendant's Exhibit Dowler Fasteners, Unattached, Small Hole in Leather." I ask you to look at those and say whether the first exhibit fairly embodies the structure shown and described in the Dowler patent, and, if not, why not; and I further ask you, with regard to the second of said exhibits, whether there is any instruction in the Dowler patent which would lead, of itself, a person to apply a Dowler fastener in the way that the Dowler fasteners, unattached, small hole in leather, are shown to be applied in the exhibit.

Ans. The fasteners marked "Defendant's Exhibit Dowler Fasteners, No. 795 of 1883, British," are not fair examples of the structure shown and described in the Dowler patent.

168 Their deviation from the true construction, as the result of which in application the glove leather is forced up into and squeezed against the interior of the outer dome or button head, consists in making the ring which embraces the flange of the spring socket of smaller diameter than the inner diameter of the button head at the bottom instead of making it of larger diameter, as the Dowler patent shows and describes it.

There are other deviations. The button head has no flange at the bottom, as Dowler's dome has. The tube drawn downwardly from the middle of the button head is longer than it is in the patent; so much longer, in fact, that it will permit the glove leather to be interposed between the interior of the button head and the part of the spring socket adjoining the rivet, which the Dowler rivet tube will not permit because it is too short.

No such manner of application of the metallic parts to the glove as is exhibited in Defendant's Exhibit Dowler Fastener was in any way indicated or suggested in the Dowler patent, and the Dowler patent does not show nor describe any glove fastening capable of such a manner of application to the glove.

There is no illustration, description, or suggestion in the Dowler patent which would of itself lead a person to apply a Dowler fastener in the manner in which it is shown to be applied in Defendant's Exhibit Dowler Fasteners, Unattached, Small Hole in Leather.

Cross-examination by W. B. H. DOWSE, Esq., of counsel for defendant:

Cross-int. 21. Are you the same Edward E. Quimby who testified in a suit entitled "Ball Glove Fastening Company *v.* Ball and Socket Fastener Company" pending in this circuit?

Ans. I am.

(Adjourned.)

MARCH 30, 1889.

Cross-int. 22. Will you please examine the Richardson patent, 260,050, referred to in Defendant's Exhibit File-wrapper and Contents No. 1 and state whether or not you agree with Mr. Brown, complainant's expert, that the fastener shown therein is substantially like the Kraetzer fastener; and you may refer, if you please, to Brown Drawing Ball and Socket Fastening Company *v.*
169 Kraetzer, S. T., sp'l ex'r, — to the figures Kraetzer No. 1, Richardson, 260,050.

(Objected to by counsel for complainant as not opened in the direct. Defendant's counsel replies that he has a right to test the witness's knowledge for the purpose of showing the value of his testimony, and also that, as this witness is called purely as an expert to support Mr. Brown's testimony, it is certainly fair and proper to discover whether these two witnesses agree on the record.)

Ans. I understand the testimony of Mr. Brown, to which my attention is now called, is contained on the tenth and eleventh pages of complainant's printed record and also in a paragraph on page 15 of complainant's printed record in which Mr. Brown refers to his preparation and lettering of the series of drawings referred to in the question. I agree with Mr. Brown that the Kraetzer drawing and Richardson drawing exhibit spring sockets which are alike in the broad respect that they yield to admit the knob of the fastener and then contract against or toward the neck or smaller part of the knob. I understand that it is by reason of that similarity of action that Mr. Brown expresses the opinion that "the Kraetzer fastener embodies the invention shown in the Richardson patent, No. 260,050, and referred to in the first and second claims thereof." I do not understand Mr. Brown to assert that the two spring sockets in question are alike in form, and I think that, in giving my direct testimony in this case, I have referred to these two spring sockets as being two examples differing from each other in form but both having the characteristic capacity of operation in respect of yielding to admit the knob and afterward contracting against the smaller part of the knob.

Cross-int. 23. As I understand you, then, the Kraetzer fastener embodies the invention shown in the Richardson patent, No. 260,050. Am I right?

(Objection continued.)

Ans. That depends upon how broadly the Richardson patent may be properly construed. If the claims of the Richardson patent can be broadly construed, or, in other words, if Richardson was the first inventor of a spring socket for a glove-fastener knob which
170 would yield to admit the knob and then contract against the neck or smaller part of the knob, and if that is to be taken to be "the invention shown in the Richardson patent," then the Kraetzer fastener could be properly said to embody that invention.

Cross-int. 24. Was Richardson the first inventor of a spring socket

for a glove-fastener knob which would yield to admit the knob and then contract against the neck or smaller part of the knob?

(Objection continued.)

Ans. I think not.

Cross-int. 25. What do you understand to be the new thing shown in the drawing, described in the specification, and particularly referred to in the first and second claims of the Richardson patent, No. 260,050?

(Objection continued.)

Ans. The Richardson patent, by itself, may be taken to assert that the new thing claimed is a ball-and-socket joint, the socket of which has yielding sides which allow the ball to be inserted and removed at will and which will hold the ball when in place; but, in view of the prior state of the art, what seems to me to be the new thing in the part of the Richardson patent now under consideration is the cup-shaped socket with spheroidally curved wings, which has somewhat the shape of a sleigh bell, except that the space between the edges of the wings is greater than it is in a sleigh bell.

Cross-int. 26. Do you find, in your opinion, that the Kraetzer fastener embodies the "new thing," namely, "the cup-shaped socket with spheroidally curved wings"?

(Objection continued.)

Ans. I do not.

Cross-int. 27. Please examine Richardson patent, No. 300,508, and state what you understand to be the new thing shown in the drawings, described in the specification, and particularly referred to in the first claim thereof.

(Objection continued.)

Ans. According to the patent, as I understand it, the new thing shown, described, and claimed in the first claim is a glove-fastener socket having spring sides and which is provided with a tubular extension and with a flange at the point of junction of the
171 spring sides with the tubular extension. The tubular extension is to serve, as I understand it, the purpose of an eyelet for fastening the socket to the glove fabric.

Cross-int. 28. Do you find, in your opinion, that the Kraetzer fastener embodies the new thing which you say is the invention embodied in the patent No. 300,508?

(Objection continued.)

Ans. I do find in the Kraetzer fastener what, according to the Richardson patent 300,508, is the new thing of that patent, to wit, the tubular extension with which the Kraetzer socket is provided, and which serves as the eyelet for fastening the socket in the glove. Kraetzer's socket does not employ the form of spring which is employed in the Richardson socket, but instead of that employs an older form, to wit, a split ring similar to the split ring used in the Bayer fastener of British patent No. 809 of 1877. Bayer supported

his spring ring by means of two tongues, which clasped around it on opposite sides. Kraetzer, on the contrary, so shapes the shell of his socket as to provide an annular recess, open on its concave side, in which recess the Kraetzer ring is deposited, and from which it projects sufficiently to be engaged by the head of the knob and pushed back into the recess when the knob is inserted in the socket, after which a portion of the ring springs out of the recess and against the neck or smaller part of the knob.

Cross-int. 29. Do you find that the Kraetzer fastener embodies the device referred to in the first claim of the Richardson patent No. 300,508, in view of the state of the art as you know it?

(Objection continued.)

Ans. I do not at this moment recall any example in the prior art of a glove-fastener socket provided with a tubular extension to serve as a rivet for fastening it to the glove. Assuming Richardson to have been the first to provide a glove-fastener socket with a tubular extension, then I think the first claim of the Richardson patent No. 300,508 can fairly be taken to cover the Kraetzer fastener. Under this assumption, I should not regard the fact that Kraetzer's socket is made of several pieces as material, and I am of the opinion that the equivalent of the flange a^2 of the first claim of the Richardson patent is to be found in those parts of Kraetzer's socket
172 which bear against the side of the glove leather opposite to the side upon or toward which the end of the rivet is turned over.

Cross-int. 30. As I understand you, this opinion last expressed is on the assumption that Richardson was the first to attach the socket of a glove-fastener with a rivet.

(Objection continued.)

Ans. I don't know why you should have any such understanding. I may, perhaps, make my meaning more plain by calling attention to the fact that the first claim of the patent is limited to a fastening which is integral with the socket, by which I understand is referred to the tubular extension of which we have been speaking.

Cross-int. 31. Do you find in the Kraetzer fastener a socket or cup-shaped member having spring sides such as are shown in the Richardson patent 300,508?

(Objection continued.)

Ans. I find in the Kraetzer fastener a cup-shaped socket having spring sides, but the spring sides in the Kraetzer socket are not the same as the spring sides in the Richardson socket. Kraetzer uses three pieces in his structure, while Richardson uses only one.

Cross-int. 32. Will you now please look at the Schloss French patent, Fig. 13, and say how the socket is attached to the fabric?

Ans. The socket represented in Fig. 13 of the French patent to Schloss has its edge folded over the edge of one flange of a rivet which bears upon one side of the glove fabric, while the barrel of the rivet is intended to go through a hole in the fabric and to have

its projecting end turned over on the other side of the fabric, or upon a washer lying against the other side of the fabric.

Cross-int. 33. Do you find in this Fig. 13 a tubular extension to serve as a rivet for fastening the socket to the glove?

Ans. No. The fastening instrumentality in Fig. 13 is a hollow rivet, which is not integral with the socket, and is not a tubular extension of the socket in the sense in which those words are employed in the Richardson patent.

Cross-int. 34. You misunderstand my question. Does not Fig. 13 show a socket provided with a rivet to serve to fasten it to the glove?

Ans. Not exactly. It shows a socket united to a rivet by
173 having its edges folded over the flange of a rivet, and that rivet is intended to fasten the socket to the glove. The expression "provided with a rivet," — seems to me, might convey the idea that the rivet was an integral part of the socket, which it is not in this case.

Cross-int. 35. Your answer, then, as I understand it, is "Yes"?

Ans. The socket is shown in Fig. 11, the rivet in Fig. 12, and the two parts are shown united in Fig. 13.

Cross-int. 36. Assuming that the part marked *i* in Figs. 11 and 13 of the Schloss French patent is resilient, do you find therein a socket having spring sides?

Ans. Yes.

Cross-int. 37. Assuming that the part *i* in Fig. 13 is resilient, do you find in Fig. 13 of the Schloss French patent a socket having yielding sides made of several pieces attached to the fabric by an eyelet?

Ans. Yes.

(Adjourned.)

APRIL 1, 1889.

Cross-int. 38. Do you find that the Kraetzer fastener embodies the new thing or invention shown in the Richardson patent, No. 300,510, and particularly referred to in the first claim thereof?

(Objected to by counsel for complainant as before.)

Ans. I do not.

Cross-int. 39. Please state what you understand to be the new thing or invention shown in the drawings, described in the specification, and particularly referred to in the first claim of the Richardson patent No. 300,510.

(Objection continued.)

Ans. The new thing referred to in the first claim of the Richardson patent, No. 300,510, is a structure made of two pieces of metal, the various parts of which are indicated in the claim by the use of five different reference letters, which structure consists of a disk having its edges turned under to form a return-bend flange, and having its central portion appropriately slit and punched downward to form two converging wings which are to serve as the spring

sides of a glove-fastener socket, the said socket being secured to the glove leather by a rivet, one flange of which bears against
174 the under side of the glove leather and the body of which passes through a hole in the glove leather, and the other flange of which is forced into the bight of the return-bend flange of the socket piece, which return-bend flange bears upon the upper side of the glove leather as represented in Fig. 3.

Cross-int. 40. Will you please state, as concisely as possible, the reason why you do not find this new thing you speak of in the first claim of the Richardson patent, No. 300,510, in the Kraetzer fastener?

(Objection continued.)

Ans. Because the said first claim imposes the conditions that the structure shall consist of a "section" having a flange, a^5, and having yielding sides a^5; the flange a^5 and the yielding sides a^2 are respectively the return-bend flange and the convergent wings which I have described and which constitute the socket piece. The claim prescribes that the structure shall further consist of an eyelet, b^1, having a flange, b^2 (which is the eyelet flange bearing, as I have stated, against the under side of the glove leather); and, further, that the end b of the eyelet shall be turned within the recess formed by the flange a^5, or, in other words, as I have previously stated, that the upper flange of the eyelet shall be forced into the bight of the return-bend flange of the socket piece.

Now, the Kraetzer fastener does not contain the socket and eyelet which the said first claim calls for, and, of course, does not employ a return-bend flange for the socket piece into which the upper flange of the eyelet is forced; and it is, in brief, because the Kraetzer fastener does not employ such a socket piece and eyelet united in the manner described that I do not find in the Kraetzer fastener the thing which the said first claim calls for.

Cross-int. 41. How does the socket and eyelet of the Richardson patent, No. 300,510, differ from the socket and eyelet of Richardson patent, No. 300,508? You may, if you please, refer to the Brown drawing.

(Objection continued.)

Ans. The material difference is that in the socket of the Richardson patent, No. 300,510, the socket piece is secured to the leather by a separate eyelet, while in the socket of the Richardson patent,
175 No. 300,508, the eyelet is a tubular extension formed in one piece with and starting from the inner edge of the return-bend flange of the socket piece, whereby the eyelet, which is the fastening instrumentality, is made "integral" with the socket. In short, the socket of the Richardson patent, 300,510, is not provided with the tubular extension which is the characteristic feature of the socket of the Richardson patent, 300,508.

Cross-int. 42. And lacking this characteristic it does not embody the Kraetzer fastener, as I understand it. What I mean is, that is your reason.

(Objection continued.)

Ans. The Kraetzer fastener does not, in my opinion, contain the invention described in the first claim of the Richardson patent No. 300,510 for the reasons which I have given, and the socket referred to in the said first claim "does not embody the Kraetzer fastener" for one reason, among others, because it does not contain the tubular extension which the Kraetzer fastener contains.

Cross-int. 43. The Richardson patent No. 300,508 distinctly states: "In lieu of making the tubular extension or eyelet in one piece, with a socket or cup, the same result is obtained if the edge of the socket or cup which now makes the flange encloses the flange of a separate tubular rivet or eyelet, and the two parts may be united either before the fastening is secured in place for use or during the act of so securing it." Did you have this in view when you construed the claim as you have?

(Objection continued.)

Ans. I did. The fact is as stated in the quotation contained in the question. The alternative form of construction therein set forth is described and claimed in the Richardson patent No. 300,510, which is of the same date as the Richardson patent No. 300,508, in which latter patent the said alternative form of construction is not claimed, but, on the contrary, the tubular extension or integral fastening is claimed.

Cross-int. 44. As I understand you, a button-hole member in order to come within the terms of the first claim of Richardson patent 300,508 is not limited to one where the spring sides are integral with the tubular extension or fastening. Is this so?

176 (Objection continued.)

Ans. I think it is not. Provided the socket shell is integral with the fastening device by which the socket is attached to the glove leather, it is, as I understand it, immaterial whether the sides of the socket themselves constitute the springs or whether they are so shaped as to contain a spring. Broadly considered, both modes of constructing the springs of glove-fastener sockets were old in the art. The new thing consisted in making the socket and its fastening device in one piece, whereby the obviously useful result was obtained of diminishing the labor and expense of assembling the parts of the structure in the act of applying it to the glove.

Cross-int. 45. It was old, then, as I understand you, to attach resilient sockets of a glove-fastener with an eyelet at the date of the Richardson patent 300,508?

(Objection continued.)

Ans. That inference is not warranted by my last answer, in which I simply referred to the fact that it was old to make the sides of a socket shell serve as springs, as Richardson does, and also old to employ a spring ring, for example, like that shown in the Bayer British patent. I shall have to examine the prior patents again before I can answer the question whether it was old to fasten the spring

socket of a glove by means of an eyelet. I will make such examination, if desired.

(Counsel for defendant says he will defer that examination for the present, for he supposed witness familiar with the state of the art.)

Cross-int. 46. Will you point out what you call the socket in the Richardson patent 300,508?

(Objection continued.)

Ans. The socket in the upper part of Fig. 11, for example—that is, it is all of the structure of Fig. 11, except the tubular extension, which is to serve as a rivet.

Cross-int. 47. How about Fig. 8?

(Objection continued.)

Ans. The same answer applies to Fig. 8. The structure includes the wings a^1 and the return-bend flange around the periphery of the circular part of the structure. The letters a^2 and a^5 in the drawings are applied to the upper and lower folds of the re-
177 turn-bend flange, although the letter a^5 is used in the drawings as the designation of the shoulder which the under side of the return-bend flange affords for bearing upon the glove leather.

Cross-int. 48. In other words, as I understand you, the socket of the Richardson patent, 300,508, is the same thing as the upper member of the structure illustrated in Fig. 6 of the Richardson patent, 300,510?

(Objection continued.)

Ans. Yes; except, of course, that the return-bend flange in the latter case is left open to admit the upper flange of the eyelet.

Cross-int. 49. Will you please point out in the Kraetzer fastener the socket which corresponds to the socket of the Richardson patent, 300,508 and 300,510, referring, if you please, to the Brown drawing?

(Objection continued.)

Ans. The Kraetzer socket is that part of the structure below the tubular extension which passes through the glove leather and serves as the rivet for fastening the socket to the glove leather, and embraces the cup-shaped shell, the annular cap sprung over the mouth of the shell, and the split ring or spring ring, as Kraetzer calls it, which is contained in the annular space between the inner side of this cap and the shoulder part of the cup-shaped shell.

Cross-int. 50. Will you please examine Defendant's Exhibit Platt Patent of 1876 and state whether or not it shows a resilient button-hole member attached to the fabric by a tubular extension, making an integral fastening or attaching device?

(Objection continued.)

Ans. It does not. It shows an eyelet which is slit longitudinally

through its barrel and through both of its flanges. This eyelet serves as a button-hole, and by reason of being slit through longitudinally it is capable of being spread open when the head of the stud or knob is pressed through it and of contracting around the neck of the stud. It is not properly described as having a tubular extension.

Cross-int. 51. Will you please state what you understand to be the new thing or invention shown in the drawings and described as the button-hole member in the Platt patent of 1876?

178 (Objection continued.)

Ans. In brief, the new thing in the Platt patent, according to the specification and claims, is the longitudinally slit rivet, which serves as the button-hole, which is of itself claimed in the second claim of the patent, while in the first claim it is claimed in combination with the tubular stud.

Cross int. 52. Do you find the new thing you speak of in the said Platt patent and particularly referred to in the first and second claims thereof in the Kraetzer fastener?

(Objection continued.)

Ans. No.

Cross-int. 53. Why not?

(Objection continued.)

Ans. Because the Kraetzer fastener does not contain any rivet or eyelet having a slot breaking the continuity of the annulus formed by its flanges and shank or body, which is what is specifically called for in the second claim of the Platt patent and which is a prescribed element of the combination set forth in the Platt patent.

Cross-int. 54. Does the Platt patent of 1876 show a resilient button-hole member?

(Objection continued.)

Ans. Yes.

Cross-int. 55. Isn't the flange that turns over the edge of the material to which this spring button-hole is attached integral with the spring button-hole?

(Objection continued.)

Ans. Yes; the flange is part of the slit eyelet.

Cross-int. 56. And isn't it turned down to hold the spring button-hole in place in precisely the same way the tubular extension is turned down in the Richardson patent, 300,508?

(Objection continued.)

Ans. It is upset like the flange of any other rivet. It is not, however, a continuous flange.

Cross-int. 57. Your answer, then, as I understand, is yes, only the flange in the Platt eyelet is slit in one place and in the Richardson is continuous?

(Objection continued.)

179 Ans. Yes.

Cross-int. 58. Isn't the barrel of any eyelet a tubular extension from its flange?

(Objection continued.)

Ans. I think it would be more proper to say that the flanges are an extension of the barrel. As a matter of fact, I am of the impression that structures of the character of eyelets have been made by spinning over or upsetting the end of a tube to form a flange.

Cross-int. 59. Do you know, as a matter of fact, how eyelets are made?

(Objection continued.)

Cross-int. 60. My impression is that I have seen either eyelet machines or drawings of eyelet machines, but I do not now distinctly recall their construction and mode of operation.

Cross-int. 61. Then you can't say whether the barrel is drawn from the flange or not?

(Objection continued.)

Ans. I find that I am unable to recall the matter sufficiently to be able to state of my own knowledge how rivets are made, but I have no doubt they can be made by drawing out the central portion of a disk into a tubular form.

Cross-int. 62. Referring, now, to the Richardson patent, No. 300,508, does not this language, which I quote from the Platt patent of 1876, accurately describe the manner in which the socket of the said Richardson patent is attached to the fabric: "This eyelet is secured to the fabric by punching a hole therein, passing the shank of the eyelet through the hole and upsetting the end of the shank to form a flange as in the application of ordinary eyelets"?

(Objection continued.)

Ans. It accurately describes the manner of fastening to the fabric of the eyelet to which the Richardson socket is integrally attached.

Cross-int. 63. And shows, does it not, that "the obviously useful result — was obtained of diminishing the labor and expense of assembling the parts of the structure in the act of applying it to the glove" was old before the date of the Richardson patent, No. 300,508?

(Objection continued.)

180 Ans. My language quoted in the question referred to a different type of structure, consisting of a spring socket *per se* and an eyelet *per se*, and the saving to which I thus called attention was that arising from the fact that in the structure shown and described in the Richardson patent, 300,508, the eyelet and socket are integral, so that they do not require separate handling in the act of applying the structure to the glove. The Platt contrivance is simply an eyelet, longitudinally slit, so that it may serve as a spring lining for a button-hole. Being in one piece, of course the Platt

eyelet can be applied to the fabric with the same ease as the Richardson.

(Adjourned.)

APRIL 2, 1889.

Cross-int. 64. Will you please state what the new thing is shown and described in the Richardson patent, No. 300,509?

(Objection continued.)

Ans. According to the Richardson patent, No. 300,509, the invention of the patent is an improvement upon the glove-fastener shown and described in the prior Richardson patent, No. 276,714. The structure shown in the Richardson patent, No. 300,509, therefore belongs to the type of glove-fasteners in which are employed a hollow knob formed upon the end of an arm attached to one glove lap and a spring socket for engaging the knob, which socket is formed upon the end of an arm attached to the other glove lap.

The described new features are, first, the arrangement of the socket so that its mouth is toward the surface of the article to which the structure is attached, whereby the socket is adapted to be shut over the knob (which the patent calls "the ball"), and thus cover or partly cover the ball on the top and sides. The second new feature is the provision in the ball member of a flat under surface, which bears upon the glove leather and prevents the ball from tipping. The third new feature consists in providing the ball member at its base with outwardly projecting tongues, which are described and shown in the specification and drawings as the "stops or projections a^2," the object of these stops being to prevent the socket from turning too far laterally on the ball. The fourth new feature consists in providing the ball member with a tongue projecting outward in
the direction of the length of the arm to which the ball is
181 attached, and which is described and shown in the specification and drawings as the "fulcrum projection a^3." This projection bears on the edge of the socket when the two arms of the fastening are pressed downward, and, as the patent says, "acts as a fulcrum and in connection with the shank of the ball member forms a lever of the second order, whereby the ball is easily removed from the socket." This fulcrum projection is claimed in combination with the socket member, and it is obvious that the projection has the effect of increasing the radius of the ball member and of making that radius considerably exceed the radius of the part of the socket member upon which the projection bears when the two arms of the fastening are pressed downward. The fifth new feature, according to the patent, is that the socket member, by having downwardly extending yielding sides adapted to enclose the ball member upon its edge and upper surface, is itself provided with an upper surface adapted to be ornamented. The sixth alleged new feature is a socket member with yielding sides and having its arm or shank curved in cross-section.

Cross-int. 65. In view of the state of the art, what is there new in the Richardson patent No. 300,509, in your opinion?

(Objection continued.)

Ans. I think all the features referred to in the claims are new in the particular type of glove-fasteners to which the patent relates.

Cross-int. 66. In view of the prior state of the art, do you find in the Kraetzer fastener the new thing or things which you say are in the Richardson patent No. 300,509, and particularly referred to in the claims thereof?

(Objection continued.)

Ans. In my opinion the prior state of the art is such that it does not permit such a broad construction of the claims of the Richardson patent No. 300,509 as would make those claims or either of them cover the Kraetzer fastener.

Cross-int. 67. Will you state your reasons a little more fully for this last opinion?

(Objection continued.)

Ans. I find that the one feature of the fastener claimed in the Richardson patent No. 300,509 which is employed in the Kraetzer fastener is the socket open at the bottom, and hence adapted
182 to receive and contain an upwardly projecting knob. This feature is also a characteristic of the fasteners shown and described respectively in the prior existing British patents of Schloss and Bayer; and it is because of these facts that I am of the opinion that the claims of the Richardson patent 300,509 are not susceptible of a broad enough construction to make them cover the Kraetzer fastener.

Cross-int. 68. Do you agree with Mr. Richardson, the treasurer of the complainant company, and Messrs. Clarke and Raymond in their opinion stated in the Richardson patent 260,050 that in a metallic glove-fastener consisting of a button-hole member and a button member that it makes no difference in which member the spring or yielding part exists, or, to quote the words of said patent: "Of course the position of these parts of the fastening in relation to each other may be reversed in relation to the glove or other article with which they may be used without departing from the spirit of this invention, and the spring or yielding part of the device, instead of being in the sides of the socket, may be in the ball, the ball being constructed to have sides which yield automatically in relation to each other to diminish its diameter upon being inserted into the socket, and springing out again to the original shape when the pressure upon the sides is released"?

(Objection continued.)

Ans. I see nothing to object to in the proposition set forth in the quotation contained in the question; but I have never made any special examination of the Richardson patent 260,050 with a view to ascertaining the scope of the invention therein referred to, and I am therefore not fully informed concerning the application of the proposition in question.

Cross-int. 69. Will you please examine the Richardson patent

No. 325,698 and state what new thing, in view of the prior state of the art, you find in that patent?

(Objection continued.)

Ans. The Richardson patent 325,698 relates to a fastener, the socket member of which resembles in construction and manner of attachment the socket member of the Mead fastener. It contains two features which, in view of the prior state of the art as I now recall it, are new. One of these new features consists of a
183 pointed prong, which is either provided with a cap and inserted through a hole in the centre of the dished washer which bears immediately upon the outer surface of the glove leather, or the prong is formed integrally with the dished washer and projects downward therefrom, so that, in either case, in fastening the socket to the glove it is unnecessary to first make a hole in the glove leather, because the pointed prong is capable of being made to pierce the glove leather, and thus make a hole for itself. The lower portion of the prong projects through a hole in the centre of the socket shell, and by being upset or clinched serves to bind the socket to the under surface of the glove leather. This feature contributes the element of novelty to the combination referred to in the first and second claims of the patent.

The other new feature of the patent consists in providing the external cap which covers the dished washer with a tapering extension at the bottom, the lower edge of which bears on the surface of the glove leather. The effect of this extension is to increase the depth of the cap or button head so that the socket shell on the under side of the glove lap may set well up within the button head, with its mouth or lower edge projecting but little, if any, below the under surface of the glove lap. This tapering extension, which is called in the patent "the tapering sleeve *e*," contributes the element of novelty to the third claim.

Cross-int. 70. Do you find in the Kraetzer fastener the elements of novelty or either of them which you say exist in the Richardson patent No. 325,698 and more particularly described in the claims thereof?

(Objection continued.)

Ans. I do not.

Cross-int. 71. Will you state briefly your reasons for your last opinion?

(Objection continued.)

Ans. Simply because the socket member of the Kraetzer fastener does not have its parts united and fastened to the glove by the prong described in the Richardson patent, and because the button head of the Kraetzer button member is not provided with the tapering extension described in the Richardson patent.

184 Cross-int. 72. I notice, referring to the file-wrapper and contents of the Richardson patent No. 300,508, that the office letter of May 9, 1883, states as follows: "The device is indefinitely

described and in such sweeping terms as to cover almost any form of fastener with spring arms. The drawings illustrate not only what are called modifications, but also what might be styled modifications of modifications. In the present close state of the art there is no warrant for any such broad presentation of the case, and it should be limited to a single definite invention before further action;" and in view of this action the applicant cancelled the first claim filed and also several other claims. Will you please state, in view of the prior state of the art, whether you find in the Kraetzer fastener the device claimed in the second claim of the Richardson patent No. 300,508?

(Objection continued, and also as characterizing improperly the action of the solicitor, who had no such view or motive in cancelling the claim.)

Ans. I have glanced through the copy of the contents of the file of the Richardson patent No. 300,508, and I find that the second claim of the patent embodies in its language the matured view of the invention to which that claim relates, not only of the attorneys, but of the examiner who was the author of the letter of May 9, 1883, containing the matter quoted in the question.

Now, upon the assumption that Richardson was the first to provide the socket of a glove-fastener with an integral eyelet or prong-fastening extension, I find that the Kraetzer fastener employs the invention of that claim, because the Kraetzer socket is provided with an integral tubular extension which serves as an eyelet for securing the socket in place, and because the Kraetzer socket has a recess for containing the knob which is the equivalent of the "recess a^6" of the claim, and because it also has a portion of greater diameter than the diameter of the tubular extension which is the equivalent of the "flange a^2" of the claim, and which serves as the bearing for the side of the glove leather opposite that from which the tubular extension projects, and because it is provided with a spring ring which is the equivalent of the "yielding sides a^1" referred to in the claim.

185 Cross-int. 73. Will you please state if the attachment of the socket of the Mead fastener is substantially the same as the attachment of the socket of the spring-ring chamber of the Kraetzer fastener?

Ans. The two things are not the same in respect of their fastening devices, because Kraetzer uses the tubular eyelet integral with the socket shell, while Mead uses a separate rivet or eyelet. They are alike in respect of the fact that by the fastening devices in both cases the parts of the structure are secured to the glove leather and to each other in like relation.

(Adjourned.)

APRIL 3, 1889.

Cross-int. 74. If the return-bend flange of the button-hole member shown in the Richardson patent No. 300,508 were formed so as to present an annular recess, and if a spring ring were contained

therein and the spring rings a^1 were cut off, would the structure thus modified contain the invention referred to in the first and second claims of said patent?

(Objection continued.)

Ans. In my opinion it would, because the spring ring was already known in the art as a suitable device for engaging a glove-fastener knob, as shown in the Bayer British patent, No. 809 of 1877, and also in the United States patent No. 181,979, to Platt, dated Sept. 25, 1876.

I have been under the impression that the Bayer British patent was older than the Platt patent, and that the Platt patent was subordinate to the Bayer patent. I now observe that the contrary is the fact, and that Platt anticipated Bayer in the employment of the spring ring and knob combination in glove-fasteners.

Cross-int. 75. If the return-bend flange spoken of in the last question were made in two pieces of appropriate shape to hold together and present a recess for the spring, would this contain the device of the first and second claims of said Richardson patent 300,508?

(Objection continued.)

Ans. In my opinion it would.

Cross-int. 76. If the upper edge of the return-bend flange
186 spoken of in the last question were bent outward and made to enclose the edge of a hole through the middle of a dished washer or cap, would the structure, so modified, contain the device of the first and second claims of said Richardson patent No. 300,508?

(Objection continued.)

Ans. The addition of the dished washer does not prevent the structure from still containing the tubular extension or fastening integral with the socket referred to in the first and second claims of the Richardson patent, and therefore I am of the opinion that the device so modified would still be within the terms of those claims.

Cross-int. 77. Will you please examine Fig. 6 of the English Schloss patent, No. 1450 of 1870, and say whether or not you find therein a button-hole member having spring-yielding sides and an integral tubular extension?

(Objection continued.)

Ans. I do. The nut e is a tubular extension from the flat portion of the socket in the sense that it is tubular and extends therefrom, but the structure is not of such a character as will permit it to be struck up in dies, which is the characteristic of the tubular extension about which we have been speaking.

Cross-int. 78. Will you please examine Defendant's Exhibit Pringle Patent and state whether or not you find illustrated in Fig. 2 therein a glove-fastener socket provided with a tubular extension to serve as a rivet for fastening it to the glove?

(Objection continued.)

Ans. I do not. I find illustrated in Fig. 2 a spring containing a chamber or button head fastened to the fabric by means of what the patent calls "a stud-receiving tube," which is an elongated rivet and is slotted to permit the spring contained in the chamber or button head to extend into the tube and against the circumferentially grooved portion of the stud or knob.

Cross-int. 79. Is there any socket in this fastener?

(Objection continued.)

Ans. Yes. The spring is the socket, and the knob has access to it through the tube. The chamber containing the spring is not integral with the rivet.

187 Cross-int. 80. Will you please define the word "socket"?

Ans. The term "socket" has been used in the course of this examination as signifying broadly a contrivance capable of yielding to admit a knob and of then springing back against the neck or smaller part of the knob. In some cases the yielding portions have been the side walls of the chamber into which the knob is inserted and in other cases have been spring rings or springs supported in suitable relations to the structure.

(Adjourned.)

APRIL 9, 1889.

Cross-int. 81. Is it or not, in your opinion, right to assume, where an invention is described as an improvement on a formerly patented invention, that the invention or improvement must reside in the features that distinguish the improved device from the previous one upon which it is an improvement?

Ans. Of course the invention always resides in that which distinguishes the device from what has gone before, whether what has gone before is contained in a patent particularly referred to or in the art generally.

Cross-int. 82. In the Richardson patent 300,508 I notice this statement: "Of course, in lieu of the striking down or drawing from the blank represented in Fig. 1 an eyelet or fastening tube, I may strike down or draw central fastening prongs." Will you please describe your understanding of this statement?

(Objection continued.)

Ans. The statement quoted refers to something which is not illustrated in the drawings, and what is meant by it is left to be conjectured. I infer that if the blank represented in Fig. 1 should be slit radially in various directions from its centre, so that each of the radial slits would be equal in length to one-half of the diameter of the tubular extension illustrated in Fig. 2 and the slit portion should then be struck down, the wedge-shaped pieces thus struck down would constitute "central fastening prongs" within the meaning of the statement cited from the specification.

Cross-int. 83. That is, as I understand you, the tubular ex-
188 tension *a* would in that case have the appearance of a crown wheel with V-shape teeth?

(Objection continued.)

Ans. Yes.

Cross-int. 84. If the teeth were not V shaped, but simply rectangular at the lower ends, they would be prongs, would they not?

(Objection continued.)

Ans. Literally speaking, no; prongs have sharp points.

Cross-int. 85. Would you not, then, regard them as prongs?

(Objection continued.)

Ans. I should probably describe them, if I had to describe them, as tongues. What the patent means in this connection is matter of conjecture.

Cross-int. 86. Will you please look at patent No. 125,502 and state whether or not it shows a socket or cup-shaped member of a glove or other fastening having spring sides and an integral fastening or attaching device?

(Objection continued; and also, as the document has not hitherto been put in evidence, counsel for defendant now offers in evidence the patent referred to, and the same is marked "Defendant's Exhibit Taynton Patent, S. T., sp'l ex'r.")

Ans. It does not.

Cross-int. 87. Why not? What does Fig. 6 show?

(Objection continued.)

Ans. In the first place, neither Fig. 6 nor any other figure shows, nor does the specification describe, "a socket having spring sides." Fig. 6 and several other figures show a cup-shaped object provided with a circumferential flange, which is referred to in the specification as "the cap B." The flange of this cap, upon its inner side, is provided with projecting bosses, which are respectively lettered in the drawings *e*, and concerning which I find this statement in the specification: "The caps B, which cover the knob and protect the fastening devices, are provided with projecting prongs *e e*, by which they are secured to the curtain A or on other substances and placed where it is desirable to use them." The drawings do not show, nor does the specification describe, how the "prongs *e e*" are made to secure the cap to the curtain; but I infer that they may be
189 intended to be upset or turned over upon the face of a washer applied to the side of the curtain opposite that to which the cap is applied. They are not "central fastening prongs," but more nearly resemble, in respect to their location and relation to the cap, the tongues B B, shown and described in the Bayer British patent, 809 of 1877. In Taynton's curtain-fastener the knob is fastened in its seat in the cap by means of a sliding key having in one part of it a hole large enough to allow the knob to pass through, and in an

adjoining part of it a slot only wide enough to admit the circumferentially grooved portion of the knob.

Cross-int. 88. Will you please examine patent No. 60608 and state whether you find therein a socket of a glove or other fastening having spring sides, flanges, and an integral attaching or fastening device?

(Objection continued.

Counsel for defendant offers in evidence the patent last referred to, No. 60608, and the same is marked "Defendant's Exhibit Acker Patent.")

Ans. I do not. Acker's spring socket is, as the patent calls it, "a gum-elastic plate," which has a hole cut through it for the reception of the knob and one or more slits extending radially outward from the edge of the hole. It has no integral fastening devices, but is held in place by means of two annular plates which are applied respectively to opposite sides of the curtain and surround a hole cut through the curtain. One of these plates is provided with teeth, which project at right angles from its edge and which pass through the curtain and are bent over the edge of the other plate. These two plates are the "fastenings," and they are not integral with the spring socket.

Cross-int. 89. How is the Kraetzer socket held in place?

Ans. By a tubular extension from the centre of the socket shell, which is applied to the under side of the glove leather, and which is provided with the annular recess for containing the spring. This tubular extension extends through the fabric, and at its outer end is upset upon the exterior surface of the button head which is applied to the outside of the glove leather.

Cross-int. 90. In other words, it is held in place by two
190 things which are applied respectively to opposite sides of the material, is it not?

Ans. On the contrary, it constitutes in itself one of the two things to which you refer. Kraetzer employs a spring-mouth socket, using for its resilient element a split ring contained in a recess in the wall of the socket formed to receive the ring. The split ring thus carried is the equivalent for a socket having yielding sides. In both cases the interior of the socket constitutes the chamber for containing the knob, and the spring mouth the means for retaining the knob by pressure against or toward the neck or smaller part of the knob. As compared with the Kraetzer structure, Taynton's gum-elastic plate is simply a yielding button-hole.

Cross-int. 91. Will you please examine the letters patent No. 66413 of July 2, 1867 (which I herewith offer in evidence as Defendant's Exhibit Talcott Patent), and say whether you find therein a socket for a glove or other fastening having spring sides, flanges, and an integral attaching or fastening device?

(Objection continued.)

Ans. No; there are no flanges in Talcott's device. Talcott's contrivance is an elastic button-hole made of a rubber disk with a hole

in it. It is fastened to the carriage curtain by being placed between a washer provided upon its edge with downwardly turned teeth and an annular metallic plate provided with radially projecting tongues. These tongues are first bent radially inward so as to compress the toothed washer against the rubber, and are then each bent outward to a right angle. A hole is made in the curtain and the contrivance is applied to it so that the tongues project through this hole, after which the tongues are bent radially outward and downward against the outer surface of the curtain. In a certain limited sense the rubber ring is a spring socket, but in this case, as in the case of the Acker contrivance, there is no chamber for receiving and concealing the knob, but the knob projects entirely through the structure and has the same relation to it that a button has to an ordinary button-hole.

Cross-int. 92. You have stated that if the device shown in the Richardson patent 300,508 were formed so as to present an annular recess, and if a spring ring were contained therein, and if
191 the spring wings a^1 were cut off, that the device so modified would come within the first and second claims of that patent. How does the structure shown in Fig. 2 of Defendant's Exhibit Talcott Patent differ from the device thus modified?

(Objection continued.)

Ans. It is proper that I should remark that my statement referred to in this question was made upon the expressed assumption that Richardson was the first to provide the socket member of a glove fastening with the "tubular extension" or integral tubular eyelet which is referred to in his patent No. 300,508, and also that the whole subject of the place in the art to which the said Richardson patent is entitled has been brought to my attention for the first time during this cross-examination, and that prior to my cross-examination I had no occasion to examine the various patents which have been shown me except for the purpose of discovering whether either of them contained what I understand to be and what in my direct examination I testified to be, in my opinion, the new thing contained in the Mead fastener described in the patent in suit. In the course of my cross-examination I have said in substance that I did not recall any patent prior to the Richardson patent 300,508 which showed a glove-fastener socket provided with the tubular extension. I have not yet been shown any such patent.

Fig. 2 of the Talcott patent, which is now inquired about, does not show any tubular extension, but merely shows the tongues of the blank illustrated in Fig. 1 bent at first radially inward and then at right angles with the plane of the blank.

Cross-int. 93. Does Fig. 2 of the Talcott patent show a socket having spring sides provided with an integral prong-fastening extension?

(Objection continued.)

Ans. No; the language of the question would be a very inapt description of the thing shown in Fig. 2 of the Talcott patent. It

is true that the plate which confines the rubber button-hole ring upon the inner washer is provided with tongues which are integral with it, and which by being bent in the manner shown serve to hold the parts of the structure together and also serve as the means for attaching it to the curtain.

192 Cross-int. 94. In comparing Fig. 2 of the Talcott patent and the modified structure of the Richardson patent referred to in cross-int. 92 it is true, is it not, that they are alike in respect of the fact that by the fastening devices — both cases the parts of the structure are secured to the material and to each other in like relation and both by a fastening device which is integral with the spring-containing structure?

(Objection continued.)

Ans. No; Talcott uses and has to use a washer, which is interposed between the rubber and the bent-over portions of the tongues. On the contrary, the Richardson modified structure is provided with an annular recess open on its concave side and into which the split ring is sprung, according to the conjecture which I made concerning what was meant by the statement contained in the Richardson specification which was being referred to. Therefore the modified Richardson structure would embrace but two things—the spring ring and the metallic shell. Talcott's Fig. 2 represents a structure composed of three things—the annular plate provided with tongues, the rubber button-hole ring, and the toothed washer. It cannot, therefore, be said with correctness that "in both cases the parts of the structure are secured to the material and to each other in like relation." It is true that both of them are attached to the fabric by fastening devices which are integral with the spring-containing structure.

Cross-int. 95. Isn't the spring-containing structure in each case placed on the exposed side of the material and attached by an integral fastening device—that is, in each case is it not secured to the fabric by punching a hole therein, passing the fastening through the hole, and upsetting its end outwardly on the unexposed side of the material?

(Objection continued.)

Ans. Richardson's device is placed and attached as described in the question, and I infer that Talcott's is, because such was the mode of placing an attachment of a similar elastic button-hole contrivance described in Talcott's prior patent of Nov. 13, 1866, to which the specification of the present Talcott patent refers.

193 (Counsel for defendant offers in evidence the Talcott patent of 1866 just referred to, and the same is marked "Defendant's Exhibit Talcott Patent of 1866.")

Cross-int. 96. Does not Defendant's Exhibit Talcott Patent of 1866 show a structure composed of two things, a spring-containing structure having integral fastenings and the button-hole ring?

(Objection continued.)

Ans. It does.

Cross-int. 97. The Richardson patent, No. 300,508, says: "The invention is an improvement on that described in my letters patent numbered 260,050 and dated June 27, 1882, and 276,714, dated May 1, 1883, and it consists in a cup or socket preferably made from one piece of metal." Will you please compare Fig. 17 of said patent No. 276,714 with the female member of the Richardson patent No. 300,508?

(Objection continued.)

Ans. The female member of the fastener shown in Richardson patent 300,508 is secured to the glove by a tubular rivet, which is integral with it. The cup or female member illustrated in Fig. 17 of patent 276,714 is secured to the glove by means of a rivet or eyelet passed "through its bottom," the fastening device in this case not being integral with the cup.

Cross-int. 98. I asked you in cross-int. 45 whether it was old at the date of the Richardson patent 300,508 to attach resilient sockets or female members of a glove-fastener with an eyelet. You replied that you did not know, but would make such an examination if desired. Can you now answer this? And, if so, please do so.

(Objection continued.)

Ans. Yes, I can answer the question now, because I find that Fig. 17 of the Richardson patent 276,714 shows an eyelet employed to fasten to the glove the socket member of a glove-fastener.

Cross-int. 99. Is the socket of Fig. 17 resilient?

(Objection continued.)

Ans. It does not certainly appear from the drawings and specifications whether it is or not. According to Fig. 17 it is a cup, the entire wall of which is continuous.

(Adjourned.)

194 APRIL 10, 1889.

Cross-int. 100. Does the Richardson patent 260,050 show a female member in one structure—that is, a socket or cup-shaped member of a glove or other fastening having spring sides and an integral fastening or attaching device?

(Objection continued.)

Ans. It does.

Cross-int. 101. The second claim of the Richardson patent 276,714 is as follows: "The member of a glove or other fastening having the sides and bottom of a socket made from one piece of metal, as described, provided with the arm *b* and the extension *c*." Is not this extension *c* a tubular extension like a rivet?

(Objection continued.)

Ans. What is called the "extension *c*" is too slight to serve the purposes of a rivet and does not, in fact, extend below the lower

horizontal plane of the arm. The arm is corrugated; it has its convex side upward, and the lower edge of the so-called extension *c* is in the same plane as the lower edges of the corrugated arm.

Cross-int. 102. I do not ask for the dimensions of this "extension *c*," which is sufficiently large in the estimation of the patentee and his attorneys to form one element of the claim. Is it a tubular extension?

(Objection continued.)

Ans. In the preceding question you ask whether the thing *c* is a tubular extension "like a rivet." It is not, for the reasons which I gave in the answer to that question. You now ask whether it is a tubular extension, to which I reply it is.

Cross-int. 103. Referring to the Mead patent, 325,688, is it a metallic glove-fastener in which a bulbous projection or button secured to one flap of a glove is seated in a laterally yielding spring socket affixed to the other flap of a glove?

Ans. It is.

Cross-int. 104. I notice that on Dec. 12, 1888, you testified in another case that this type of glove-fastening was old in the art long before 1883, and that examples of it were shown and described in the British patent to Schloss, No. 1450 of the year 1870; British patent to Bayer, No. 809 of the year 1877; United States
195 patent to A. G. Mead, No. 227,440, dated May 11, 1880, and United States patent to E. Pringle, No. 260,411, dated July 4, 1882. Is not this so?

Ans. It is.

Cross-int. 105. Referring now to Fig. 17 of the Richardson patent 276,714, would it be a different mode of attachment if the eyelet were integral with the socket?

(Objection continued.)

Ans. The parts would have the same relation to the fabric, but the mode of assembling them required for the structure represented in the said Fig. 17 would not be practised if the eyelet were integral with the socket. In the latter case the operator would be required to perform only one manual operation in applying the socket to the fabric, because he would have only one piece to handle; in the former case he has two separate pieces to handle, to wit, the rivet and the socket provided with a hole in the bottom through which the rivet must be inserted preparatory to its insertion in the socket.

Cross-int. 106. Are the modes of construction the same or different?

(Objection continued.)

Ans. They are different in the respects which I have indicated.

Cross-int. 107. Are the differences material or immaterial?

(Objection continued.)

Ans. They are material, at least so far as this: that the feature

in question was made an element of claim in the later Richardson patent and was subsequently employed in the Kraetzer fastener.

Cross-int. 108. Would the mode of construction, referring to said Fig. 17, be different if a washer was used having the eyelet extension integral therewith?

(Objection continued.)

Ans. There would be the difference which the question itself indicates. There would still be the two pieces requiring separate handling, but requiring only one riveting operation, with this difference, however, that the washer would have to be supported upon the stationary anvil and the riveting operation performed by a plunger made to pass down into the socket. This would be
196 a slightly less convenient way of performing the riveting operation than that which would naturally be employed in riveting the structure illustrated in Fig. 17, in which case the head of the eyelet can be supported on a stationary anvil which extends up through the socket or cup.

Cross-int. 109. Would the differences you speak of be material or immaterial, in a patentable sense?

(Objection continued, and as being a question of law.)

Ans. According to my understanding, they would not be material in that sense.

Cross-int. 110. You say that making the eyelet integral with a washer and upsetting it in the cup is an immaterial difference, in a patentable sense, from the way shown in Fig. 17. Now, would there be any material difference, in a patentable sense, if instead of having the eyelet integral with a washer and upset in the cup it was integral with the cup and upset on a washer?

(Objection continued.)

Ans. I think not.

Cross-int. 111. I notice in your testimony in another case you made this statement: "The button-hole member of the Mead glove-fastener is composed of two dished washers placed on opposite sides of the glove lap and fastened to each other and the glove lap by means of a central hollow rivet. To form this rivet the central portion of the outer dished washer is drawn into a short tube, which projects inwardly through the glove lap and through the central hole in the inner washer upon which the inner end of the tube is turned over and upset. The outer portion of the inner washer is notched in two places, and between these places is curved upward and inward to form the spring flanges for embracing the knob of the fastener. This mode of constructing the button-hole member of a glove-fastening, to wit, by use of an exteriorally flanged socket piece, is shown and described in the drawings and specification and claimed in the first claim of Richardson's United States patent No. 276,714." This is so, is it not?

Ans. Yes; that is so. I was referring to certain exhibits of Mead fasteners.

197 Cross-int. 112. Did these exhibits differ from the fasteners represented in the Mead patent, No. 325,688?

Ans. Only, as I now remember, in respect of the fact that the hollow eyelet was a tubular inward extension of the outward washer instead of being in a separate piece, as shown in the Mead patent.

Cross-int. 113. Is this difference a material one?

Ans. That difference was immaterial to any issue in the case in which I gave the testimony referred to.

Cross-int. 114. Would the Mead structure come within the terms of the Richardson patent No. 300,508?

(Objection continued.)

Ans. That would depend, of course, upon the construction which the court might give to the Richardson patent. Under what I conceive would be a fairly broad construction of the Richardson patent, it would come within the terms thereof.

Cross-int. 115. And the Mead structure that you have in mind is one which is made with the eyelet integral with the button head, as shown in the Mead patent, as I understand it?

Ans. It is.

Cross-int. 116. Will you now please state how the eyelet which connects the two washers of the button-hole member of the Mead patent is upset?

Ans. The statement in the Mead patent is in substance that the tube of the eyelet blank is inserted through the hole in the dished washer or button head *e* and then through a hole in the fabric and through a hole in the socket shell, and then the riveting operation is performed by upsetting the end of the tube against the concave surface of the socket.

Cross-int. 117. Will you please compare the button head or stud of the Mead patent, 325,688, with the button head or stud of the Platt patent, 181,979, and say whether the construction of the two is not substantially alike?

(Objection continued.)

Ans. They are alike in these respects: that they are each composed of two metallic cups provided at their mouths with flanges; that one cup is made smaller in diameter than the other, but

198 greater in length, and that the larger cup is made to have a contracted mouth, and that the mode of fastening them to the fabric consists in placing the flange of the larger cup against the surface of the fabric immediately adjoining a hole made therein and then pressing the smaller cup through the said hole into the larger cup with sufficient force to cause the upsetting and lateral expansion of the inner cup and the bearing of its flange against the surface of the fabric opposite that against which the flange of the larger cup bears. The differences between the two structures are that the tubular portion of Platt's inner cup is originally of uniform diameter, while the tubular portion of the Mead inner cup is circumferentially corrugated near the flange, and in uniting the parts of the Mead structure the metal at the mouth of the outer cup is

convergently compressed toward the inner tube, so that when the parts are united the mouth of Mead's outer cup is relatively to the rest of the cup contracted to a greater extent than the mouth of the Platt outer cup is.

Cross-int. 118. Is the stud shown in Defendant's Exhibit Platt Patent of 1876 a flanged ball or sphere formed from a sheet of metal intact and provided with an interior chamber with a fastening rivet adapted to be inserted and upset or expanded within said chamber or ball?

(Objection continued.)

Ans. It is.

Cross-int. 119. Is the stud of Defendant's Exhibit Platt Patent of 1876 composed of a flanged tubular fastening rivet constructed in one piece and provided with a head or neck, in combination with a flanged hollow ball which receives said head and is held to the material by said rivet?

(Objection continued.)

Ans. It is.

Cross-int. 120. Will you now examine the Mead patent and state what proportion of the dished washer on the upper side of the fabric is occupied by the flange of the rivet?

Ans. The patent does not prescribe what proportion of the dished washer shall be occupied by the rivet flange. The diameter of the rivet and the width of its flanges are matters requiring for
199 their determination the exercise of mere mechanical judgment. The drawings, like patent drawings generally, are designed to show the relations of the parts and are not in respect of their proportions exact working drawings.

Cross-int. 121. What kind of a rivet is shown in Fig. 4 of the Mead patent, 325,688, and is that the only kind of rivet that is shown in the button-hole member?

Ans. The rivet shown in Fig. 4 is a short tube flanged at one end, and is the only kind of rivet represented as being used in the button-hole member.

Cross-int. 122. The flange of this rivet is shown as a large, wide, flat flange, is it not, the outside diameter of which is more than twice the length of the tube?

Ans. That is true of the rivet shown in Fig. 4, but not true of the others. The drawings do not show the proportions accurately.

Cross-int. 123. Is not the outside diameter of all the flanges of any rivet shown in the button-hole member of the Mead patent, 325,688, nearly or about half an inch?

Ans. Yes.

Cross-int. 124. Will you please examine Complainant's Exhibit Glove with Kraetzer Fastener and say whether or not, in your opinion, there was any annular recess in that button head before the fastening was set upon the glove?

Ans. I have no opinion on the subject. I think it would be entirely possible to compress the button head so as to seat the rivet

flange in it as it is in the exhibit in the act of performing the riveting operation.

Cross-int. 125. Would a rivet, upset as shown in Complainant's Exhibit Glove with Kraetzer Fastener, attach to the glove leather the spring-containing structure practically without a washer of some kind on the exposed side of the material?

Ans. No.

Cross-int. 126. Do you think that in the ordinary method of setting these glove-fastener rivets it would be possible to upset the rivet on the upper side of the dished washer of the Kraetzer fastener, if the washer has originally a perfectly smooth surface, without necessarily thereby seating the upper end of the rivet in the washer
200 in the position it occupies in Complainant's Exhibit Glove with Kraetzer Fastener?

Ans. I do.

Cross-int. 127. Have you had any personal experience in this matter?

Ans. I have witnessed the operation of setting glove-fastener rivets, and I have myself set rivets for other purposes.

(Adjourned.)

APRIL 11, 1889.

Cross-int. 128. Referring now to Fig. 17 of the Richardson patent 276,714, the hole in the fabric is just the size of the outer diameter of the barrel of the attaching eyelet, is it not?

(Objection continued.)

Ans. Yes; it is so represented in the drawing.

Cross-int. 129. Making a hole in a piece of fabric of just the size of the barrel of the attaching eyelet in which to insert the attaching eyelet was well known prior to the date of the Mead patent, 325,688, was it not?

Ans. It was.

Cross-int. 130. How small, relatively to the size of the socket piece, must the hole in the fabric be, where a socket like that shown in the Mead patent, 325,688, is used and attached as there shown?

Ans. It must be enough smaller than the extreme diameter of the socket to insure the fabrics being folded up into the dished washer E and griped between the inner surface of the dished washer E and the outer surface of the socket.

Cross-int. 131. You have stated that it would not be invention to add a washer to the figure shown in Richardson patent 276,714. If a dished washer were added to this figure what would be the position of the fabric—that is to say, how would it differ from that shown in Fig. 12 of the Mead patent, 325,688?

(Objection continued.)

Ans. It would not differ. The combination of the dished washer with the socket was Mead's invention. While it would not involve invention to employ an ordinary flat washer as in the contrivance shown in said Fig. 17, it did constitute invention to combine with

the socket and rivet therein shown a dished washer. As re-
201 sult of that combination, Mead obtained in his glove-fastener the peculiar advantages which I described in my direct examination.

Cross-int. 132. How did Mr. Mead, the alleged inventor of patent 325,688, obtain the peculiar advantages which you seem to have discovered, and not Mr. Mead, by the use of the flat plate E described in the Mead patent, 325,688? Mr. Mead says this, referring to the cap or dished washer, as you term it: "The disk E may be a flat plate, but in the present instance I have shown its outer edge or circumference bent, in order to approximate to the general shape of the button head when the latter is pressed into its finished form, and thus it strengthens said cap."

Mr. Mead has also stated, in the testimony in this case (*vide* this record, pp. 125–'6), in regard to the disk E: "I would answer that I have made models to show the meaning of the language in the patent specification, which show the different modifications which I described but did not show in the drawings. The exhibit marked 'Defendant's Exhibit Mead Modification No. 1' shows one application where the disk E is a flat plate with a filling of leather or paper back of the eyelet to prevent the defacement of the cap when the two parts are pressed together and the eyelet is set, and to keep the plate flat. The filling is partly to give the button form to the cap to retain it in that form.

Defendant's Exhibit Modification No. 2 shows the flat plate without the cap, as it would be if made as in Fig. 12, where no cap is shown.

Defendant's Exhibit Mead's Modification No. 3 shows the fastening in the form of a capped eyelet, as mentioned on page 3 of my patent, where it commences 'in lieu of being made as shown and described in Fig. 2.'"

Ans. The inventor's supplemental contribution of facts relating to the invention which is the subject of his patent does not impress me. He may have built better than he knew, or he may choose to disavow his invention. I am only concerned to discover what new thing the patent itself shows and describes.

True, the specification says, "The disk E may be a flat plate."
But it also appears that when the parts are assembled, by
202 placing the centrally perforated disk E with the eyelet in it into the button-shaped cap F, and inserting the lower extremity of the eyelet into the opening of the socket D, after the socket has been placed in position upon the under side of the material and centrally of the hole therein, the button-shaped cap is placed in a similarly shaped die, and by means of a rounded plunger the lower extremity of the eyelet is swaged or pressed out laterally, by which process the disk E is made to approximate very nearly in shape to the outside periphery of the button head. Now, I understand by this statement, and it is manifestly the fact, that if a flat disk or washer be employed the effect of uniting the parts in the manner described will be to transform such flat washer into a dished washer.

The specification only refers to the disk E as a "flat plate" when describing the construction of the socket member illustrated in Fig. 2, in which the imperforate button head F is employed.

When the specification comes to describe the construction illustrated in Fig. 12, in which the disk E alone constitutes the button head and in which it is represented as dished, nothing is said intimating, directly or indirectly, that a flat washer or perforated disk may be substituted in place of the dished washer or button head. The patent does not show and it does not describe any finished socket member in which the button head or the washer, against which the flange at the outer end of the rivet bears, is in the form of a perforated flat plate. It is true that so far as concerns the mere purpose of fastening the socket to the under side of the fabric by means of a central rivet, a flat external washer could be used; but in that case what I find to be the new thing of the Mead socket member would not be present, and the most important advantage of Mead's invention, that of confining the glove leather in the cavity presented by the button head, would not be attained.

Cross-int. 133. I notice in the Mead patent it states as follows: "In a fastening device of the class before premised, a somewhat similar difficulty has existed in securing the socket or hollow inclosing portion of the fastening as has occurred in attaching the ball or inclosed portion thereof, and I have therefore constructed such socket member as follows: D represents in Figs. 5 and 6 diametrical cross-sections of a hollow socket provided with yielding sides. This form of socket has heretofore been secured to the upper side of the fabric by a lateral arm, which does not present a neat or ornamental finish, and is liable to catch and be torn from the article. Hence I propose to radically change the position thereof and employ the active or socket portion below the fabric, and dispose an ordinary fastening eyelet, *l*, through said socket D. This eyelet is located centrally of the socket, and when this part of the fastening is completed is secured and rests at its top between the cap or button head F, which surrounds the whole and the disk E, while its lower extremity is similarly upset upon and over the interior periphery of the socket D."

203

Is it true that this form of socket was never before secured to the upper side of the fabric except by a lateral arm, and did Mead radically change the position thereof, and was the attachment of the socket by an eyelet centrally located anything new at the date of the Mead patent?

Ans. It may be true that the identical form of socket illustrated in the drawing of the Mead patent was not previously attached except by a lateral arm. It was not new with Mead to apply to the overlapping flap of a glove a spring socket with its mouth opening downward to receive a knob affixed to and projecting outwardly from the underlapping glove flap, and it was not new to fasten such a socket to the ovelapping glove flap by a central eyelet or rivet.

Cross-int. 134. I now show you Defendant's Exhibit Mead Modification No. 3 and ask whether, in your opinion, it contains what you have described as the new thing in the Mead patent.

Ans. In my opinion, it does employ the Mead invention in question because the button head presents upon its under side a recess up into which the glove leather is squeezed when the socket is riveted into position. The invention is not so effectively employed in this exhibit as it would be if the recess were deeper.

Cross-int. 135. Where in the Mead patent do you find any statement of what you describe as the new thing in the Mead patent?

Ans. I find in the Mead patent an elaborate description and ample illustrations of the socket member of a glove fastening, in the construction and mode of attachment of which the "new thing"
294 which I have described is inherent and which possesses the advantages to which I have called attention. I do not find these advantages among those enumerated in the patent nor any statement in words that the "new thing" accomplished by the structure described and shown consists in the squeezing of the glove leather up into the recess in the button head. In that respect, so far as his patent indicates, the inventor, in my opinion, builded better than he knew, because it would be impossible to follow out the instructions of his patent in making the socket member of a glove fastening such as his drawings show and his specification describes without including in it the "new thing" in question and without attaining the advantages accruing from the presence of that "new thing."

Cross-int. 136. In short, then, you do not find a single word in the whole specification asserting the advantages which you allege nor any statement that squeezing the glove leather up into the recess of the button head was a new thing?

Ans. I do not.

Cross-int. 137. Will you please state if anything is said in the Mead patent about the size of the hole to be made in the fabric to which the fastening is to be attached?

Ans. Nothing, except the inventor says in lines 115 and 116 on page 2 of the printed specification: "I punch a hole in the material sufficient to enter the eyelet *l*."

Cross-int. 138. If the Dowler fastener shown in Fig. 3 of Defendant's Exhibit Dowler Patent should be attached to the fabric by some manufacturer, so that the hole in the fabric was of sufficient size only to allow the insertion of the integral attaching tube of the button head or cap, would such a fastener so attached come within the terms of the Mead patent, 325,688, in your opinion?

Ans. If the contrivance illustrated in Fig. 3 of the Dowler British patent were so modified in construction as to permit of its being attached to the glove leather in the manner described in the question, and if it were otherwise so modified as to make it a practical spring-mouthed socket for a glove-fastener, it would come within the terms of the Mead patent.

(Adjourned.)

205 APRIL 12, 1889.

Cross-int. 139. Will you kindly answer my question?

Ans. The trouble with your preceding question is that it involves at least one assumption which, I think, is not warranted by the facts, and that is that the structure shown in Fig. 3 of the Dowler patent is adapted to be attached to the glove leather in the manner suggested in the question. In my judgment it is not so adapted.

Cross-int. 140. Will you kindly answer my question?

Ans. I can only give what is in substance the same answer, but in negative form. If a manufacturer should undertake to fasten the structure represented in Fig. 3 of the Dowler patent by making a hole in the fabric only of the size of the rivet, in my opinion he would not have an operative structure. In other words, he would not succeed in effecting the mode of attachment which is employed in the Mead and Kraetzer fasteners, and therefore he would not have a fastener which would come within the terms of the Mead patent, 325,688.

Cross-int. 141. Then your answer is no. Am I right?

Ans. My answer is no, with the explanations which I have given.

Cross-int. 142. My understanding of your answer is this—am I right? If a manufacturer should fasten the structure represented in Fig. 3 of the Dowler patent by making a hole in the fabric only of the size of the rivet, then he would not have a fastener which would come within the terms of the Mead patent, No. 325,688.

Ans. You are travelling in a circle. If the structure represented in Fig. 3 of the Dowler patent could be attached to the fabric in the manner suggested and were so attached, and if it were in other respects an operative structure, it would fall within the terms of the Mead patent; but, as represented in the drawing and described in the specification of the Dowler patent, the structure is crude and impractical, and is not adapted for the mode of attachment to the fabric, which is the characteristic of the Mead socket member.

Cross-int. 143. You say, "If the structure represented in Fig. 3 of the Dowler patent could be attached to the fabric in the manner suggested and were so attached, and if it were in other
206 respects an operative structure, it would fall within the terms of the Mead patent." Why?

Ans. Because it would then, of necessity, have those modifications in structure which would make it like the socket member of the Mead patent, whereby the glove leather would be pushed up into the recess in the button head and squeezed between the inner surface of the button head and the exterior surface of a socket having a spring mouth capable of contracting against or toward the neck or smaller part of a knob introduced into the socket chamber.

Cross-int. 144. As you are unwilling to answer my question and persist in travelling in a circle, I will interpose this inquiry: What modifications of structure do you refer to?

Ans. First, an elongation of the rivet tube *l*, which will allow space for the admission of the fabric between the top of the socket shell *b* and the under side of the button head *k*, and preferably a

change in the form of a socket shell, by which opportunity will be afforded to grip the fabric along an annular line at a little distance from the edge of the hole through which the eyelet would be inserted, and finally the substitution of a more effective spring-mouthed socket. For the purpose for which the structure is designed, if these modifications should be made the so-called flanges b^2 and the interiorly grooved ring b^3 would not only be superfluous but probably objectionable as interfering with the resiliency of the socket. They would, therefore, better be removed and the side walls of the socket be continued convergently to the necessary distance instead of being flared outwardly, as they are shown to be in the drawing.

Cross-int. 145. On reading your direct testimony and noticing the position you took on the Dowler fastener, I purposely heretofore asked you a question in regard to the eyelet of the Mead patent. It was cross-int. 120. Your answer was: "The patent does not prescribe what proportion of the dished washer shall be occupied by the rivet flange. The diameter of the rivet and the width of its flanges are matters requiring for their determination the exercise of mere mechanical judgment. The drawings, like patent drawings generally, are designed to show the relation of the parts and are not, in respect of their proportions, exact working drawings." I
207 agree with you in this statement. Now, will you, on the supposition that the rivet tube l, shown in Fig. 3 of the Dowler patent, is long enough for the admission of the fabric between the top of the socket shell and the under side of the button head, answer my question, which was: If a manufacturer should fasten the structure represented in Fig. 3 of the Dowler patent by making a hole in the fabric only of the size of the rivet, would he then have a fastener which would come within the terms of the Mead patent, No. 325,688?

Ans. Upon that supposition or "assumption," as I have expressed it, the structure would then, in respect of its mode of attachment, fall within the terms of the Mead patent, subject, however, to the objection that the mere elongation of the rivet, without any change in the socket, would not secure a permanently effective grip of the fabric between the exterior of the socket and the interior of the button head. The fabric would only be gripped around the edge of the hole through it and would be released from grip by a pull subjecting it to a small range of radial movement. On the contrary, in the Mead fastener, as in the Kraetzer fastener, the line of grip is so far from the edge of the hole through the fabric that the fabric may be given a considerable radial movement without releasing it from the gripping parts of the structure.

Cross-int. 146. Referring now to the button-hole member of the Kraetzer fastener, does the part affixed to the under side of the fabric have a flange at its lower end?

Ans. The part attached to the fabric happens to be made in two pieces. It might, I think, be made in one piece. It would then be properly described as having a return-bend flange at its lower end. As it is constructed its lower end has the form of a return-bend flange.

Cross-int. 147. The part of the button-hole member affixed to the under side of the fabric in the Dowler patent, Fig. 3, has a flange at its lower end, has it not?

Ans. The two wings of the socket shown in Fig. 3 are each provided at the bottom with an outwardly turned flange. These flanges are lettered in the patent b^2 and are each enclosed in an interiorly recessed ring, lettered b^3, so that in cross-section the shape of the lower end is that of a return-bend flange.

208 Cross-int. 148. Will you please look at the structure which I now show you and state whether or not it is a member of a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it may be centrally attached to the fabric?

Ans. It is.

(Counsel for defendant offers in evidence the exhibit referred to, and the same is marked "Defendant's Exhibit Mead Fastener, April 12, 1889.")

Cross-int. 149. Do you find in the Kraetzer fastener a button-hole fastening device composed of a hollow socket with spring or yielding lips disposed upon the under side of the flap and centrally secured to the latter by a button head?

Ans. Not literally, if by the expression "spring or yielding lips" is meant the spring wings of the Richardson socket. I do find in the Kraetzer fastener the spring ring, which was, so far as I know, first shown in the Platt patent and subsequently in the Bayer British patent, and which was therefore a known substitute for Richardson's spring wings or lips. Therefore, treating the spring ring of Kraetzer as a known substitute and equivalent for "spring or yielding lips," I do find in the Kraetzer fastener a "button-hole fastening device" meeting the conditions of the question.

Cross-int. 150. Then literally your answer is no?

Ans. Certainly; if the question is to be answered literally, I say no.

Cross-int. 151. Referring now to Fig. 3 of the Dowler patent, do you find therein a member of a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it is centrally attached to the fabric?

Ans. No; I do not find in Fig. 3 any adequate means for attaching the socket member centrally to the fabric. The central portion of the socket is not attached to the fabric, but is at a distance from the edge of the hole through the leather, and there is no sufficient grip upon the fabric to maintain the socket in a position concentric with the hole in the fabric when the structure is subjected to the ordinary conditions of use.

Cross-int. 152. Are you aware or not that in the manufacture of glove fastenings it is customary to make a good many dif-
209 ferent sizes of fasteners of a particular style and to make these fasteners with special adaptation to the wants of the trade, in accordance with whether they are to be used on heavy or thin material, and that if a structure like that, for instance, shown

in Fig. 3 of the Dowler patent were desired by a manufacturer to be used on extremely heavy goods or on extremely light goods he would notify the seller of the fasteners of the fact and the attaching tube would be made longer or shorter to correspond with the class of goods desired?

Ans. I am aware that glove-fasteners are made of various sizes, and I have no doubt they are made "with special adaptation to the wants of the trade, in accordance with whether they are to be used on heavy or thin material." I do not see that there would be any alteration in the length of the rivet or "attaching tube" of the Dowler structure referred to in consequence of variations in the thickness of the goods. The Dowler attaching tube rivets metal to metal in any case; and if it were capable of practical use the adaptation of it to a thick structure would be made by extending the socket downward so as to leave a larger space between the top of the ring b^3 and the edge of the button head. To adapt it for use upon a thinner fabric the thinner and outside parts of the structure would simply be so proportioned as to leave a smaller space between the under edge of the button head and the top of the ring b^3.

Cross-int. 153. Will you please examine the exhibit which I now hand you and state whether or not it is a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it may be centrally attached to the fabric?

Ans. It is.

(Counsel for defendant offers in evidence the exhibit referred to, and same is marked "Defendant's Exhibit Mead Fastener No. 2, April 12, 1889.")

Cross-int. 154. Will you please examine Defendant's Exhibit Mead Fastener, April 12, 1889, and state whether it contains what you have described as the new thing in the Mead patent?

Ans. In my opinion, the exhibit now shown me is so distorted in the proportions of its parts that it does not possess the ad-
210 vantages of the Mead fastener, and cannot fairly be said to embody the "new thing in the Mead patent."

Cross-int. 155. Will you examine the Defendant's Exhibit Mead Fastener No. 2, April 12, 1889, and state whether it embodies what you have described as the new thing in the Mead patent?

Ans. I make the same answer with reference to this exhibit. In this case the socket is disproportionately large, and in the other case the head is disproportionately large.

Cross-int. 156. I now attach to Defendant's Exhibit Mead Fastener, April 12, 1889, a somewhat larger socket. Does this exhibit, with the larger socket of the two, embody what you describe as the new thing of the Mead patent?

Ans. The parts are still out of due proportion and the structure is open to the same criticism. With the larger socket, it more nearly approximates to the Mead fastener, but not sufficiently to entitle it, in my opinion, to be considered a practical example of the Mead invention.

Cross-int. 157. That is, it does not embody what you describe as the new thing in the Mead patent?

Ans. It comes nearer the Mead, and perhaps if I should see it applied to the fabric I should find that it contained the new thing of the Mead patent. I cannot certainly tell whether it does or not without actual trial.

EDW. E. QUIMBY.

Attest: STEPHEN THACHER,
Special Examiner.

Deposition of William S. Richardson.

Direct examination by THOMAS W. CLARKE, of counsel for complainant:

BOSTON, *March* 29, 1889.

Int. 1. State your name, age, residence, and occupation.

Ans. William S. Richardson; thirty-seven years of age; live in Boston; am treasurer of the Ball and Socket Fastener Company.

Int. 2. Are you acquainted with Albert Gallatin Mead?

Ans. I am.

211 Int. 3. Were you one of the parties connected with the Ball and Socket Fastening Company who negotiated the purchase of the Mead patent from him?

Ans. I was.

Int. 4. Did Mr. Mead at that time show you any illustrations of the fastener that he had invented and was intending to patent; and, if so, did you retain and will you produce the things which he then gave you as illustrative thereof?

(Question objected to as immaterial and irrelevant, as the Mead patent itself is the best evidence, and also because the question is leading in attempting to put into the mouth of the witness the intention of a third party.)

Ans. The exhibit marked "Sample Shown Mead at Cross-int. No. 30, A. E. L., sp'l ex'r," contains the illustrations originally shown me by Mr. Mead.

Int. 5. Did he show you, as illustrations of the fastener devised by him, any exhibit substantially like "Mead Modification Nos. 1, 2, and 3"?

(Same objection continued.)

Ans. He showed me nothing like the exhibit marked "Defendant's Exhibit Mead Modification No. 1," having a perfectly flat plate in contact with the fabric, nor like Defendant's Exhibit Mead Modification No. 2, which latter consists simply of a broad flat disk having no cap over it. He showed me nothing like Defendant's Exhibit Mead Modification No. 3, except in so far as that resembles or may resemble sample shown Mead at cross-int. No. 30.

Int. 6. Please look at the pair of buckskin gloves marked with the initials "A. E. L., sp'l ex'r," the bill and envelope marked

"Hawley, Folsom & Martin," and say whether or not you were the purchaser of those gloves, and what is the commercial name of the fasteners on those gloves.

(Objected to as immaterial.)

Ans. I was the purchaser of the gloves in question, and the commercial name of the fasteners on them is the Kraetzer fastener.

Int. 7. Whether or not, at or about the same time and the same place, you procured a pair of kid gloves, and say whether or
212 not you were the purchaser thereof, and what is the commercial name of such gloves.

(Objected to as immaterial.)

Ans. I produce a pair of thin, light-brown stitched-back street gloves, marked "A. E. L., special examiner," which I bought at the same time I purchased the buck gloves before referred to, and at the same place. In purchasing these gloves I asked for gloves having the Kraetzer fastener, and the light-brown gloves in question have upon them what is known as the Kraetzer fastener.

(The gloves produced by the witness are marked "Gloves with Commercial Kraetzer Fasteners, Buck," and "Gloves with Commercial Kraetzer Fasteners, Street, Shown Livermore at Ints. 132 and 138," respectively.

The introduction in evidence of the gloves marked "Commercial Kraetzer Fastener, Buck," and "Commercial Kraetzer Fastener, Street," is objected to as immaterial, incompetent, and irrelevant, and also improper at this stage of the case, during the taking of the complainant's rebuttal testimony; as immaterial because it does not appear by whom these fasteners have been either made, used, or sold, and because there is no evidence to in any way connect the defendant in this suit therewith, either prior to or subsequent to the filing of the bill of complaint in this suit; and notice is hereby given that counsel for defendant is informed and believes that no such fastener as these now offered in evidence has been either made, sold, or used by this defendant, either prior to or subsequent to the filing of the bill of complaint in this suit.)

APRIL 15, 1889.

Cross-examination *de bene esse* by W. B H. DOWSE, Esq., of counsel for defendant:

Cross-int. 8. Did you personally purchase the gloves referred to in your direct examination?

Ans. I did.

Cross-int. 9. Did you see the bill made out?

Ans. I did not.

Cross-int. 10. Who, if you know, made out the bill?

Ans. I do not know.

213 Cross-int. 11. Can you by inquiry find this out?

Ans. I do not know.

Cross-int. 12. Did you pay for these gloves?

Ans. I did.

Cross-int. 13. Whom did you pay?

Ans. I paid the person of whom I bought them.

Cross-int. 14. What was his name?

Ans. Mr. Folsom.

Cross-int. 15. Who is Mr. Folsom?

Ans. He is the Mr. Folsom of the firm of Hawley, Folsom & Martin.

Cross-int. 16. Can you give me his full name?

Ans. I think it is Paul F. Folsom.

Cross-int. 17. Was he one of the original incorporators of the complainant company?

Ans. He was.

Cross-int. 18. I notice that the complainant company was incorporated under the laws of the State of New Hampshire in 1884 with a capital stock of $100,000 and that there were five original incorporators—P. K. Dumaresq, William A. Newell, W. S. Richardson, Paul F. Folsom, Josiah B. Chase; that on Feb. 8, 1884, you filed a certificate of change of subdivision of capital stock, etc., and that W. S. Richardson, Josiah B. Chase, and Paul F. Folsom signed this certificate as directors of your company. I gather this information from the record of another suit, No. 2366, in equity, pending in this court. Are you the W. S. Richardson mentioned in these papers?

Ans. I am.

Cross-int. 19. Are you at present a director of the Ball and Socket Fastener Company?

Ans. I am.

Cross-int. 20. Is Paul F. Folsom a stockholder and director of the Ball and Socket Fastener Company?

Ans. He is.

Cross-int. 21. Was a Paul F. Folsom a stockholder and director of the Ball and Socket Fastener Company at the date when you purchased these two pairs of gloves?

214 Ans. He was.

Cross-int. 22. Do you know Paul F. Folsom's handwriting?

Ans. I have seen it and I might be able to identify it, but I am not certain on this point.

Cross-int. 23. Are you able to identify your own handwriting?

Ans. Possibly as well as another.

Cross-int. 24. If you were shown some handwriting you believe, as I understand you, that you are able to state whether or not it is your handwriting. Is this so?

Ans. If I were shown handwriting and asked whether it were mine or not I should probably have some strong opinion about it. I should not make the absolute assertion that I could infallibly distinguish handwriting.

Cross-int. 25. You say you purchased these gloves of Paul F. Folsom and paid him for them. In purchasing these gloves you say,

"I asked for gloves having the Kraetzer fastener." What remark in response to this did Mr. Folsom make?

Ans. It may have been because in asking for the gloves I did not explain to Mr. Folsom the particulars of what I wanted them for; but, however that may have been, I do not recollect any special remark made by Mr. Folsom in answer to my inquiry excepting a general assent to my request.

Cross-int. 26. Do you know who put these fasteners on these gloves which you have offered in evidence?

Ans. I do not.

Cross-int. 27. Do you know whether these gloves had these fasteners on them before you went into the store of Hawley, Folsom & Martin?

Ans. I think I am warranted in saying that I do know it, my reason being that I went with Mr. Folsom to the boxes in which the gloves were kept, and the two pairs you refer to were selected at random from the stock.

Cross-int. 28. You picked them out yourself?

Ans. I did not.

Cross-int. 29. Who did?

Ans. Mr. Folsom.

215 Cross-int. 30. He took the gloves out of the box, handed them to you, and asked you if that was what you wanted, didn't he?

Ans. I do not recall what he said on handing me the gloves.

Cross-int. 31. Did you ask for a bill?

Ans. I did.

Cross-int. 32. Was one given to you?

Ans. It was.

Cross-int. 33. What did you do *it* with it when it was put into your hands—take it and leave?

Ans. I did.

Cross-int. 34. Had no conversation in regard to it?

Ans. In regard to what—the bill?

Cross-int. 35. You made no objection to the bill?

Ans. The bill was made out at the entry desk and was sent up to Mr. Folsom. I told him that I wanted the item of gloves marked as being with Kraetzer fasteners to correspond with the fact, and, as near as I can recollect, he sent the bill down again to have the correction made?

Cross-int. 36. I notice that there is only one bill and that this is marked "Dec. 24, 1888," and that the item originally written was, "One pair of gloves with fasteners, $1.25." This was the way it was originally sent up. Am I right?

Ans. You are right. This bill was, I think, for the buck gloves of the exhibit; and as they were gloves produced by Mr. Folsom in response to my request for gloves having the Kraetzer fastener, I asked him to have the bill marked to show it.

(Counsel for defendant offers in evidence the bill referred to, and

the same is marked "Defendant's Exhibit Hawley, Folsom & Martin's Altered Bill.")

Cross-int. 37. Were there any other officers of the Ball and Socket Fastener Company present beside two of its directors and its treasurer when you asked to have the word "Kraetzer" added to this bill?

Ans. The only persons present at my purchase from Mr. Folsom of gloves having Kraetzer fasteners upon them were Mr. Folsom and myself.

Cross-int. 38. Do you know in whose handwriting the word
216 "Kraetzer" is on Defendant's Exhibit Hawley, Folsom & Martin's Altered Bill?

Ans. I think I do.

Cross-int. 39. Whose is it?

Ans. I believe it is the entry clerk's.

(Adjourned.)

APRIL 16, 1889.

Cross-int. 40. I notice on an examination of the record in the suit of the Ball Glove Fastening Company against the Ball and Socket Fastener Company that on April 20, 1888, you made an affidavit which was sworn to before F. F. Raymond, notary public, and that you made this statement therein:

"In addition to this, the device shown in the Mead fastener, which is pursued in this suit, was invented by me prior to the date of the invention by Kraetzer of the device shown in his said letters patent, and was described and shown in letters patent granted to me May 1, 1883, No. 276,714, applied for on the 13th of July, 1882, and is specifically different from the device shown in the said Kraetzer patent in the fact that the spring sides are at the edges of the clasping member instead of thrown up from the center of the clasping member, and for this device there was granted to me in said letters patent No. 276,714 a specific claim, viz., a member of a fastening device comprising a socket, C, formed of sheet metal and having the spring sides *d* or upper section thereof integral with the part *a* forming its lower portion, substantially as and for the purpose described. Such a socket, having such spring sides, is shown in said letters patent as fastened through its centre by an eyelet to the fabric.

The third member of a glove-fastener of this class is the mechanism by which the clasping flanges are secured to the fabric. As I have said, in the patent, the application for which was filed by me on the thirteenth day of July, 1882, and which was granted May 1, 1883, No. 276,714, this socket is shown fastened to the fabric by means of an eyelet passing through it and flanged on the other side of the fabric. This is the method in which the socket of the Mead device complained of is fastened to the fabric. There is, however, in the Mead device a dome washer or collet on the opposite side of the fabric from the socket referred to, through which dome washer or collet the eyelet passes as well as through the fabric itself."

This is so, is it not?

Ans. If the copy of the affidavit which you have shown me is correct, I have no reason to doubt that I did make this statement.

217–285 Cross-int. 41. You have read the statement, have you not?

Ans. I have.

Cross-int. 42. And it is correct, as you remember it, is it not?

Ans. I do not remember the expressions in the original document with sufficient accuracy to be able to assert whether your copy is like it or not.

Cross-int. 43. I do not refer to the correctness of the phraseology, but to the substance.

Ans. I should be unable to assert that the substance of your copy was like the substance of the original.

Cross-int. 44. The statement commences with this clause:

"In addition to this the device shown in the Mead fastener which is pursued in this suit was invented by me prior to the date of the invention by Kraetzer of the device shown in his said letters patent and was described and shown in letters patent granted to me May 1, 1883, No. 276,714."

Do you deny that you swore this on the 20th of April, 1888?

Ans. I do not. I simply do not remember.

Cross-int. 45. Have you any reason to doubt that you made this statement?

Ans. No reason for doubt occurs to me for the moment.

WILLIAM S. RICHARDSON.

Attest: STEPHEN THACHER,
Special Examiner.

* * * * * * *

286 DEFENDANT'S EXHIBIT FILE-WRAPPER AND CONTENTS No. 5, A. E. L., Sp'l Ex'r.

(2–175.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the file of this office of the file-wrapper and contents in the matter of the letters patent granted Albert Gallatin Mead, assignor to the Ball and Socket Fastener Company, September 8th, 1885, number 325,688, for improvement in button.

In testimony whereof I, M. V. Montgomery, Commissioner of Patents, have caused the seal of the Patent Office to be affixed
287 this 10th day of March, in the year of our Lord one thousand eight hundred and eighty-seven, and of the Independence of the United States the one hundred and eleventh.

[SEAL.] M. V. MONTGOMERY,
Commissioner.

To the Hon. Commissioner of Patents:

In the matter of the application of Albert G. Mead, of Boston, Mass., for a patent for "Buttons" I hereby appoint and request you will recognize William H. Babcock, of Washington, D. C., associate attorney with myself in the conduct of the case.

Signed at Boston, Suffolk county, Massachusetts, this 18th day of December, 1884.

FREDERICK CURTIS.

Petition.

To the Commissioner of Patents:

Your petitioner, Albert Gallatin Mead, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, prays that letters patent may be granted to him for the improvement in "buttons" as set forth in the annexed specification.

And I hereby appoint Frederick Curtis, of Boston, Mass., my attorney, with full power of substitution and revocation, to prosecute this application, to make alterations and amendments therein, to receive the patent, and to transact all business in the Patent Office connected therewith.

Signed at Boston, in the county of Suffolk and State of Massachusetts, this 18th day of December, 1884.

ALBERT GALLATIN MEAD.

Specification.

To all whom it may concern:

Be it known, that I Albert Gallatin Mead a citizen of the United States residing at Boston, in the county of Suffolk, and State of Massachusetts, have invented certain new and useful improvements in buttons and I do hereby declare the following to be a full
288 clear and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which forms a part of this specification.

This invention relates to metallic fastenings employed in securing the separate flaps of any article, such as gloves or other similar articles of wear in lieu of the ordinary button and button-hole and pertains especially to that class entitled ball-and-socket fastenings in which a ball is adapted to be enclosed by and retained within the hollow or socket member, when the fastening is actively employed.

I consider my present invention embraces firstly the method of centrally securing the socket portion of the fastening to the article, whereby the open part or socket of said member is disposed upon the under side of the flap and secured by a rivet extending through the fabric thus in permanently securing it to the latter a suitable

button head or cap is employed upon the upper surface of the flap and can be so formed and constructed as to form a button finish, a result much desired, since it gives the article an appearance exactly similar to an ordinary button which is the most neat and tasty finish that can be employed in the class of articles of apparel to which such fastenings are usually attached, but further the whole device is thereby concealed and prevented from becoming caught and broken; secondly in the peculiar method of forming the ball member of said fastening, as likewise that of the rivet by which the ball is secured to the fabric the two parts forming a unit and readily used in connection with the socket member, forming an article very easily manufactured, cheap and inexpensive, and one which presents an unusually ornamental finish.

The drawings represent in Fig. 1 a cross-section of a complete fastening attached to the material, composed of the two members constructed as herein specified and embodying my invention. Fig. 2 is a vertical section of the socket member completed and attached to the fabric while Fig. 3 shows a similar section of the ball member of the fastening. Fig. 4 shows the button-shaped cap with the fastening eyelet or rivet without the socket portion. Fig. 5 and 6 are cross-sections taken diametrically through the socket portion.
289 Fig. 7 is a plan of the complete socket member. Fig. 8 shows a partially completed ball struck from an intact blank. Fig. 9 represents the completed ball prior to the attachment to the material and Fig. 10 the rivet employed in fastening to the fabric the ball, which is adapted to be employed in connection with the socket.

* In these drawings I have represented the complete fastening at A, as composed of two portions B the socket or hollow enclosing part, while C represents the ball or enclosed portion, which I will now proceed to describe and may be considered as compound, since it is incomplete without its fastening rivet *a*, which secures the active or ball element *b* thereof to the fabric.

This portion *b* is formed from a flat blank *c* formed of any suitable metal by a die which at the same time operates to strike up and form a short cylinder *d* hemispherical at its extremity say from the broken line 1–2; while the diameter of said cylinder is to be the same as that of the finished ball portion *b*. After this operation the blank is transferred to a second die, or revolving rollers where the short cylinder or neck portion *d* below the line 1–2 is compressed and rounded into a hemispherical shape *e*, which completes the ball *b* see Fig. 9 moreover the metal forming the lower portion during this forming process has drawn down the top portion and shortened it slightly and the whole sphere, when completed rests snugly upon the flange *f* and is now in readiness to be secured to the fabric as one member of a fastening device of the class hereinbefore premised.

Hitherto it has been a very difficult thing to secure a member of a fastening device so constructed to the fabric, since if any device is

* "Insert '3,' Mar. 2, '85," written in red ink in the margin.

attached to its exterior periphery in order to secure it, the usefulness of the ball is very much impaired since a portion of the surface is occupied. Hence I have employed in lieu of an external fastening, which has heretofore been generally employed an internal or central fastening and in the method employed I consider exists one of the essential features of my invention.

I will now proceed to describe the second element *a* or fastening rivet of the ball portion or enclosed part of the fastening;
290 this rivet is formed somewhat similar to the other element *b* from a circular blank *g*, but the latter is struck up in the form of a cylinder hemispherical preferably at its extremity and of an external diameter equal to the opening *i* in the ball or enclosed part? Afterwards said blank is transferred to a pair of rolls, which cripple or weaken the metal at the contracted portion *j* leaving the upper portion intact and of a length, as shown by the dotted lines 5–6, slightly longer than the diameter of the ball *b* for purposes to be described. This passing of the rolls over the part *j* leaves a short neck *k* below and is of a suitable length adapted to compensate for the thickness of the fabric A^1 from this neck extends the flange, which forms a bearing for the fastening to give it steadiness and at the same time more securely affix it to the material since it encloses a larger area of the latter and prevents its tearing away.

In order to secure the ball element *b* of the member C of the fastening to the material I proceed as follows, having punched or otherwise formed a hole in the fabric, I place the ball element over said hole with the opening *i* in alignment therewith; I then take the rivet *a* for fastening the part *b* of said member C and insert it through the hole in the fabric and into the ball *b* until the cylinder *h* rests against the top of the ball, see Fig. 11, when owing to the length of said rivet the flange does not come in contact with the material A^1 and it requires to be inserted in a die in which the matrix is spherical to prevent injury to the ball in the act of securing the two elements together; then the plunger is brought down upon the flange of the fastening rivet *a*, while owing to the crippling of the metal at *j* before mentioned, which part is constructed to rest about opposite the top of the opening *i*, the metal begins to yield and spread or flatten against the pressure rolling outwards while the top of the cylinder *h* is spread out and very nearly fills the interior of the ball, approximating thereto in general shape as shown in Fig. 3. This compression or crippling of the fastening rivet *a* has somewhat reduced its length and its flange now firmly closes the material between it and the flange *f* of the button part *b*. This crippling of the material effects a second result besides that accomplished in the above description, that is it prevents any undue pressure from distorting the proper shape of the neck *k* and this always
291 ensures a proper fastening of the member C without disturbing the normal shape of said neck.

I have now in complete and perfect form a member C of a fastening device spherical in shape intact throughout its periphery and yet securely and rigidly fastened to the fabric without any exterior fast-

ening appendages by which to attach it, as is usual and impair its efficacy or detract from its appearance.

In a fastening device of the class before premised a somewhat similar difficulty has existed in securing the socket or hollow enclosing portion of the fastening, as has occurred in attaching the ball or enclosed portion thereof and I have therefore constructed such socket member as follows. D represents in Fig. 5 and 6 diametrical cross-sections of a hollow socket provided with yielding sides. This form of socket has heretofore been secured to the upper side of the fabric by a lateral arm, which does not present a neat or ornamental finish and is liable to catch and be torn from the article. Hence I propose to radically change the position thereof and employ the active or socket portion below the fabric and dispose an ordinary fastening eyelet *l* through said socket D. This eyelet is located centrally of the socket and when this part of the fastening is completed is secured and rests at its top between the cap or button head F which surrounds the whole and the disk E, while its lower extremity is similarly upset upon and over the interior periphery of the socket D. The disk E may be a flat plate, but in the present instance I have shown its outer edge or circumference bent in order to approximate to the general shape of the button head, when the latter is pressed into its finished form and thus it strengthens said cap. Moreover the eyelet *l* is passed into this disk E and secured between the latter and the button cap by pressing the two together as shown in Fig. 2.

Hence in securing this socket, or any similar hollow member of a fastening device, I punch a hole in the material sufficient to enter the eyelet *l*; having previously struck up the button-shaped cap F, I place in it the centrally perforated disk E with the eyelet in it and insert the lower extremity of the latter into the opening *m* of the socket D which has likewise been placed in position upon the under side of the material and centrally of the hole therein, in readiness for the introduction of said eyelet; when this is accomplished the button-shaped cap is placed in a similarly shaped die and with a round-headed plunger the lower extremity of the eyelet *l* is swaged or pressed out laterally. By this process the disk E approximates very nearly in shape to the outside periphery of the button head while between these two elements is retained the enlarged top of the eyelet *l*, moreover the lower extremity of said eyelet is spread out at the same operation against the interior surface of the socket D and the latter is maintained in close connection with the fabric A^2 and the parts D E F and *l* are firmly united thus completing the other member or enclosing portion of the fastening fabric.

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By reference to Fig. 12 of the drawings I have shown a slight deviation in the manner of finishing the button portion of the fastening as shown in Fig. 2 but I do not consider this modification distinct from the spirit of my invention nor embodying new matter since it would ordinarily suggest itself to one skilled in the art to which it appertains. In case it is desired the imperforate cap or button head F may be entirely removed and by this means although

not securing a button finish still the cost of making this part of the fastening is materially lessened.

Supposing this form is adopted the eyelet must be flush with the exterior surface of the disk E, in order to present a more perfect finish and at the same time to prevent the edges thereof from catching, I have formed an annular depression *q* in the top of said disk E of a depth equal to the thickness of the metal forming the eyelet *l*. Thus a smooth exterior surface is secured. In lieu of finishing the socket portion of the fastening in the manner above described a capped eyelet may be employed in which the cap of the eyelet may be extended to cover and enclose the disk E in the manner shown in Fig. 2 as accomplished by the imperforate cap or button head F since by this method the cost of the finished article is somewhat lessened.

It will readily be seen that the interior or active portion of said socket or enclosing portion is not interfered with and, the ball member can easily enter its full diameter, if so desired. On the other hand I have effectually concealed the socket portion of the
293 fastener from sight and in lieu thereof I have substituted a simple circular button, cap or head as shown in Fig. 7.

The whole fastening device, when the component parts the ball and socket are interlocked or actively employed, presents a very neat and tasty appearance since from disposing the said members in the manner above described all parts are concealed except the cap F which surmounts the whole and if it is so desired may be engraved or otherwise more or less ornamentally finished.

Claims.

[1st The portion of a fastening device composed of a flanged ball or sphere formed from a sheet of metal intact and provided with an interior chamber, whereby it may be secured to the fabric, substantially as stated.

2nd The combination with a portion of a fastening device composed of a ball intact in its periphery and provided with an interior chamber of the flanged fastening rivet adapted to be inserted and flattened within said ball by which means the two parts are united and firmly secured to said material, substantially as described.]*

3rd In a fastening device the flanged rivet composed of the head, the contracted or crippled part [*j*]† and the neck, whereby upon compression the head is spread laterally and the ball member of the fastening is secured to the fabric all substantially as and for purposes herein set forth.

4th In a fastening device of the nature described the enclosing portion composed of a hollow socket centrally secured to the fabric by a button head [F]‡ and with the enclosing portion disposed upon the under side of the flap, substantially as stated.

* Matter in brackets erased, and "substitute 1 Mar. 2 | '85" written in red ink in the margin.

† "Mar. 2 | '85" written in red ink in margin and "*j*" interlined in red ink.

‡ "Mar. 2 | '85" written in red ink in margin and "F" interlined in red ink.

5th The combination with a member of fastening device composed of a hollow socket, with spring or yielding lips, disposed upon the under side the flap and centrally secured to the latter by a button head, of the ball constructed and secured to the outside of the material in the manner substantially as set forth.

294 [6th A member of a fastening device composed of a hollow socket centrally attached to and disposed upon the under side of the fabric by a rivet and button head, substantially as described.]*

7th A member of a fastening device composed of a hollow socket D centrally attached by an eyelet *l* the latter resting upon and within an annular depression *q* formed in a concaved collet or disk E, substantially for purposes herein set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

ALBERT GALLATIN MEAD.

Two witnesses:
H. E. LODGE.
A. F. HAYDEN.

Oath.

COUNTY OF SUFFOLK, *State of Massachusetts*, } ss:

Albert Gallatin Mead, the above-named petitioner, being duly sworn (affirmed), depose- and say- that he verily believe- himself to be the original, first, and sole inventor of the improvement in buttons described and claimed in the foregoing specification; that he does not know and does not believe that the same was ever before known or used; that the same has not been patented to him, not with his knowledge or consent, in any foreign country, and that the same has not been in public use or on sale in this country for more than two years prior to the filing of this application, and that he is a citizen of the United States and resident of Boston, in the county of Suffolk and State of Massachusetts.

ALBERT GALLATIN MEAD.

Sworn to and subscribed before me this eighteenth day of December, A. D. 1884.

H. ELLERTON LODGE,
Justice of the Peace.

* Matter in brackets erased, and "substitute 2 Mar. 2 | '85" written in red ink in the margin.

295 All communications should be addressed to "the Commissioner of Patents, Washington, D. C."

95. DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Feb.* 24, 1885.

Albert G. Mead, care Wm. H. Babcock, present.

Button. Filed Feb. 2, '85. No. 154,677.

Descriptions of Figs. 11 and 12 of the drawing are omitted from the specification.

In view of the present state of the art it is not considered legitimate to dissect a device of this character and make separate claims to its several parts, especially since such parts are incapable of independent use. The claims are largely open to this objection. The 1st claim is met by patent to Krementz, No. 298,303, May 6, '84, buttons.

The 2d and 3d are substantially met by Curran, No. 176,932, May 2, '76, same class. The 4th is met by Richardson, No. 309,877, Dec. 30, '84 (Fig. 11), shoe fastenings. The 6th claim is merely to the arbitrary disposition of the device and is moreover met by Lowenthal, No. 244,632, July 19, '81, glove and corset fastenings.

E. P. BUNYEA, *Ass't Ex'r.*

J. P. CHAPMAN, *Ex.*

$\frac{95}{154677}$. WASHINGTON, D. C., 2, 28, '85.

Hon. Com'r of Patents:

The application of Albert G. Mead, buttons, filed Feb'y 2, '85, No. 154,677, is hereby amended as follows:

Cancel claims 1 and 2 and insert the following instead:

[" 1st. A flanged ball or sphere formed from a sheet of metal intact and provided with an interior chamber with a fastening rivet adapted to be inserted and flattened within said ball for the purpose set forth.

2nd. A flanged tubular fastening rivet constructed in one piece and provided with a head and neck in combination with a
296 flanged hollow ball which receives said head and is held to the material by said rivet for the purpose set forth."] *

In claim 3rd insert the reference letter "*j*" after "part," 3rd line.

Cancel claim 6 and insert:

[" 6th. A member of a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it is centrally attached to the fabric, substantially as set forth."] †

In the 4th claim insert the letter "F" after "button head."

At the end of line 22, pg. 3, insert:

* Matter in brackets inclosed in red-ink lines and "1" written in red ink in the margin.

† Matter in brackets inclosed in red-ink lines and "2" written in red ink in the margin.

[" Figure 11 illustrates the rivet in position in the hollow ball before compression.

Figure 12 represents the other member of the fastening and its attaching devices."] *

The patent of Krementz shows no rivet. That of Curran shows no tubular rivet. That of Richardson shows a shell which is not attached by a button head and not centrally attached at all.

The crippled part *j* (in addition to the neck) is not shown by Curran, and the other references have no rivets, *a fortiori* it is not shown by them.

The claims as now presented are therefore, it is submitted, allowable. As to the objection with regard to claiming separate parts, it is urged that the practice is a very common and proper one. The members of the fastening device may be sold separately, constituting independent articles, although in use they would be put together. A gun-lock would be of no use out of a gun, yet no one doubts that a gun-lock may be claimed *per se*. However, we need not go so far for an instance, for there are many of them in the same class. Few eyelets have any value except with relation to other parts, and every button requires a button-hole or its corresponding device. Yet " the combination of a button-hole with a button " would be rather
297 an odd claim. Certainly no one would insist that the hole must be thus mentioned.

Respectfully submitted.

A. G. MEAD,
By WM. H. BABCOCK, *Attorney.*

All communications should be addressed to " the Commissioner of Patents, Washington, D. C."

95. DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *Mar.* 6, 1885.

Albert G. Mead, care Wm. H. Babcock, present.

Button. No. 154,677. Filed Feb. 2, '85.

The 4th clause of claim is believed to be unwarranted in view of patent to Lowenthal, No. 244,632, July 19, '81, glove and corset fastenings, and said claim is, therefore, refused.

F. P. BUNYEA, *Ass't Ex'r.*

J. P. CHAPMAN, *Ex.*

$\frac{95}{154677}$. WASHINGTON, D. C., *March* 9, 1885.

Hon. Comm'r of Patents:

In the app'n of A. G. Mead, buttons, filed Feb'y 2, 1885, No. 154,677, the following request is hereby made:

Reconsideration is respectfully asked. Loewenthal has a button head which secures to the fabric his stud *d*, corresponding to the

* Matter in brackets inclosed in red-ink lines and " 3 " written in red ink in the margin.

rivet *a* of my case; but this is not an "enclosing part." The key-slotted plate which engages with this stud of Loewenthal's is not properly an enclosing part and certainly is not secured by anything except a plain eyelet.

Respectfully submitted.

A. G. MEAD,
By WM. H. BABCOCK, *Attorney.*

298 All communications should be addressed to "the Commissioner of Patents, Washington, D. C."

95. DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *March* 12, 1885.

Albert G. Mead, care Wm. H. Babcock, present.

Button. No. 154,677. Filed Feb. 2, '85.

Further action upon this application is temporarily suspended in view of other pending applications which embrace similar subject-matter.

E. P. BUNYEA, *Ass't Ex'r.*

J. P. CHAPMAN, *Ex.*

(2-061.) (Interference.)

U. S. Patent Office.
May 16, 1885.
Interferences.

95. DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE,
WASHINGTON, D. C., *May* 13, 1885.

Albert G. Mead, care Frederick Curtis, Boston, Mass.

Please find below a copy of a communication from the examiner concerning your application No. 154,677, filed Feb. 2, '85, "buttons."

Very respectfully, M. V. MONTGOMERY,
Commissioner of Patents.

Room No. —.

All communications should be addressed to "the Commissioner of Patents, Washington, D. C."

Your case, above referred to, is adjudged to interfere with others hereafter specified, and the question of priority will be determined in conformity with the rules.

The statement demanded by rule 105 must be sealed up and filed on or before the 11 day of June, 1885, with the subject of the
299 invention and name of party filing it indorsed on the envelope. The subject-matter involved in the interference is—

"In a glove-fastener, the ball member, consisting of a cap eyelet adapted to be secured to the flap of a glove or other similar article

by a cap-rivet adapted to be inserted through the material forming the flap into the eyelet and compressed and flattened, as set forth."

"In a glove-fastener, the socket member constructed as described, adapted to be secured to the under side of the flap of the glove by a cap disposed upon the opposite side of the flap and constructed as described to hold the material between it and the socket member, as set forth," being the 5th and 6th claims in the application of William S. Richardson, of Boston, Mass.; Clarke & Raymond, Boston, Mass., attorneys, and substantially the subject-matter of the 1st, 2d, and 4th claims in your application.

J. P. CHAPMAN, *Ex'r.*

Issue division. (2-024.) Serial No. 154,677.

All communications should be addressed to "the Commissioner of Patents, Washington, D. C."

DEPARTMENT OF THE INTERIOR,
U. S. PATENT OFFICE,
WASHINGTON, D. C., *July* 10, 1885.

Albert Gallatin Mead, asso'r, c. o. W. H. Babcock, asso., city.

SIR: Your application for a patent for an improvement in buttons filed Feb. 2d, 1885, has been examined and allowed.

The final fee, twenty dollars, must be paid, and the letters patent bear date as of a day not later than six months from the time of this present notice of allowance.

If the final fee is not paid within that period the patent will be withheld, and your only relief will be by a renewal of the application, with additional fees, under the provisions of section 4897, Revised Statutes. The office aims to deliver patents upon the day of their date and on which their term begins to run, but to do this properly applicants will be expected to pay their final fees at
300 least twenty days prior to the conclusion of the six months allowed them by law. The printing, photolithographing, and engrossing of the several patent parts preparatory to final signing and sealing will consume the intervening time, and such work will not be done until after payment of the necessary fees.

When you send the final fee you will also send, distinctly and plainly written, the name of the inventor and title of invention as above given, date of allowance (which is the date of this circular), date of filing, and, if assigned, the names of the assignees.

If you desire to have the patent issue to assignees, an assignment containing a request to that effect, together with the fee for recording the same, must be filed in this office on or before the date of payment of final fee.

Additional copies of specifications and drawings will be charged for at the following rates: Single copies, uncertified, 25 cents; twenty copies or more, 10 cents each. The money should accompany the order.

Very respectfully, M. V. MONTGOMERY,
Commissioner of Patents.

☞In remitting the final fee give the serial number at the head of this notice.

The within title is that given by the examiner in charge as most appropriate to your invention. Should you desire a change in the same, satisfactory reasons must be given therefor on or before the payment of the final fee.

Serial No. [154,677.]* Ex'r Book No. $\frac{224}{101}$.

1885. Chapman.

Patent No. 325,688, Albert Gallatin Mead, asso'r to the Ball and Socket Fastener Company of Nashua, N. H.—

Of Boston, county of ——, State of Massachusetts.

301–323 Invention: Buttons.

Parts of application filed.
- Petition, Feb'y 2, 1885.
- Affidavit, "
- Specification, "
- Drawing, "
- Model not required.
- Specimen, —.
- First fee, cash, $15, Feb'y 2, 1885.
- " cert., —.

App. filed complete, Feb. 2, '85.
Examined, July 2, '85. Chapman, ex'r.
Countersigned, July 10, '85. J. W. Babson, for Commissioner.
Notice of allowance, July 10, 1885.
Final fee, cash, $20, August 15, 1885.
" cert., 188–.
Patented Sept. 8, 1885.
Att'y or P. O. address, F. Curtis, Boston, Mass.
Wm. H. Babcock, ass'or, city.

B. 1885.

Contents.

†[$\frac{1}{2}$.] Application [1]†, paper [s]†.
1. Rejection, Feb. 24, '85.
2. [Arg'm't and amend't 1, 2, 3, Mar. 2, '85.]†
3. Rejection, Mar. 6, '85.
4. [Letter to office, Mar. 10, '85.]†
5. Letter, Mar. 12, '85.
6. Int'ce with $\frac{346}{105}$, May 13, '85.

Decided in favor of Mead, June 13, '85.
[24 clasps & buckles, button.]†
Title: Improvement in buttons.

* * * * * * *

* Figures in brackets written in red ink.
† Matter in brackets written in red ink, and "s" in "papers" erased with red ink.

324 DEFENDANT'S EXHIBIT SCHLOSS FRENCH PATENT. A. E. L., Sp'l Ex'r.

REPUBLIC OF FRANCE.

MINISTRY OF COMMERCE AND INDUSTRY.

Letters patent.

Description annexed to the patent for fifteen years, filed on the 2nd day of May, 1872, by Joseph Schloss, represented by M. Denos, No. 13 Boulevard Saint Martin, Paris, and which was granted to him by order of the minister of agriculture and of commerce on the 15th day of July, 1872, for a system of fasteners for gloves, garters, shoes, garments, belts, sashes, etc.

Patent No. 95,127.

My invention relates to a system of fasteners for gloves, gaiters, garments, shoes, belts, sashes, etc. The system which I have invented under the name of button-fastener is characterized by its method of operating, and by its peculiar construction which admits of applying it easily to the above-mentioned articles in place of buttons, hooks and eyes, and other fastening devices at present employed.

The complete fastener is composed of two parts one of which I call the socket and the other the button or stud, designed to enter the former, thus effecting the fastening together of the article. The socket is circular in appearance and has a circular opening into which the stud is inserted.

The button is a stud presenting the appearance of an in-
325 verted frustrum of a cone, which penetrates into the opening of the socket, which opening has very nearly the same diameter as that of the largest part of the cone, forming the stud pushing it in a little inclined to one side and not perpendicularly. When the stud is straightened up, it cannot be detached from the socket either by a lateral or a perpendicular tension.

To unfasten, it is necessary to incline the parts to each other.

My invention relates particularly to the construction of said fastener, that it may be applied to gloves, gaiters, shoes of all kinds, etc.

I could, moreover, make use of a split elastic stud of a diameter a little greater than the opening of the socket, compressed in order to effect its passage into the same, and expanded in the interior of the socket in order to fasten them together. In this case the stud presents a spherical surface or one having inclined planes in order to slip easily through the circular opening of the socket. Or, again, the stud could be inflexible and the opening of the socket rounded over and rendered flexible by a convenient number of slits. In short I reserve the right to manufacture a flexible stud or a socket equally flexible.

All these forms relate essentially to my invention which consists,

I repeat, in the improved application to gloves, gaiters, etc., of a system of fasteners and in the special construction of this fastener for such application, but I claim especially the first form, which I prefer, reserving the right of using the others at option.

In order to make it more clearly understood I have represented first in the annexed drawings my system of fasteners according to the first form.

(Here follows diagram marked p. 325*a*.)

Fig. 1, shows the said fastener applied to a glove, when unfastened.

Fig. 2, shows the same form, the fastening being closed.

A, is the socket and B the stud, these two pieces constituting the complete fastener.

The figures which follow show details of the stud and of the socket on an enlarged scale in order the better to show the construction and form of the different parts composing it.

326 Fig. 3, shows a vertical elevation and a plan of the stud, or button proper. It is composed of a head *a* slightly rounded at its top and with sides tapering conically inward. This stud provided at one end with a stem *b* the other end of which is threaded in order to screw into the centre of a washer *c* seen in transverse section and in plan in Fig. 4.

Fig. 5, shows a side view, a diametral section and a plan of another washer *d* which is placed upon the under surface of the washer *c* and projects downward from it, as shown in Fig. 6. This washer *d* has in its centre a tubular eyelet *e* slightly conical, forming a part of it. This tube is designed to pass into the hole made in the leather, cloth or whatever material the fastener is to be attached to.

Fig. 7, shows a diametral section and a plan of a third washer *f* having at its centre a circular opening *g* formed to receive the extremity of the tube *e* which passes through the leather, cloth etc. This opening *g* is beveled or cut away in order to present a cut-away portion in which is forced the metal of the end of the tube *e* upon the washer *f*, as seen in Fig. 8, which shows a diametral section of the button finished and fixed in place upon the leather, cloth etc.

Instead of screwing the head Fig. 3, upon the washer Fig. 4, I could rivet it or weld it, should I so desire.

Figs. 9, 10, 11, 12 & 13 & 14 shows different views of the pieces composing the other part of the fastener, that is to say the socket.

Fig. 9, shows a side view, a diametral section and plan of the cap of the socket *k*, as shown in the side view.

Fig. 10, shows a diametral section and a plan of a washer *i* which is placed in the interior of the cap *h*, as indicated in section in Fig. 11.

The washer *i* has placed in its centre a circular opening *j*—the rim of which is beveled or cut away as is shown.

Upon the washer *i* is adapted to be fastened a second washer *k*

shown in profile, in diametral section and in plan in Fig. 12, having a tube *l* altogether similar in construction to that described above (see Fig. 5), for the stud. The two washers *i* and *k* are afterwards fastened together upon the cap *h*, as is shown in diametral section in Fig. 13, and is fastened upon the leather, cloth etc, by
327 means of a washer *m*, similar to that shown in Fig. 7, the whole being represented by Fig. 14, which shows a diametral section of the socket finished and held in place.

Fig. 15, shows a side view of the complete fastener and Fig. 16, shows a diamet-al section of the same when fastened together.

As it is seen, the bevelled portion *j* of the washer *i* of the socket coincides with the inclined plane of the stud *a* by being put together in such a manner that the socket is in an inclined position relative to the stud when the fastener is opened or closed together, in order that the said stud *a* may enter the opening *j* or be removed from it.

Figs. 17, 19, 20, 21, 22 and 23 show a form of elastic stud with a split head.

Fig. 17, shows a side view and a plan of this stud.

Fig. 19, shows a side view and a diametral section and a plan of an eyelet *n*, as is shown in the side view and forming the cap of the stud. This eyelet has two slits along diameters *o o* and is provided with a lower portion *p* formed to receive a washer *q*, seen in side view, diametral section and plan in Fig. 20, having a tubular rivet *r*, altogether similar to those shown in Figs. 5 and 12, previously described.

This washer *q* is fastened upon the lower portion of the eyelet *n*, as is shown in section in Fig. 21, and the upper portion of the eyelet is contracted in such a manner as to present the appearance of a spherical stud.

The whole is secured in place upon the cloth, leather etc. by means of a washer *s* Fig. 22, similar to that in Fig. 7, as is shown in Fig. 23, which represents a diametral section of the button assembled.

It is by its elasticity obtained by the slits *o o* that the stud can be pushed into and removed from the opening of the socket, which opening in this form should be of a diameter a little smaller than that of the stud.

Fig. 18, shows a side view of a stud of the same construction, but inflexible, that is to say, not having slits. This last form of stud is intended to be employed with a socket the opening of which is rendered elastic.

To resume, I claim as my entire and exclusive property the improved application to gloves, gaiters, garments, shoes of all
328 kinds, belts, sashes, etc. etc., in place of buttons, hooks and eyes and other methods of attachment now in use, the system of fasteners above described and represented, of either form, reserving the right to use it on any appropriate material, and to make use

according to need of ornamentation, such as gilding, carving, glazing etc., upon the leather, cloth, etc. etc.

Paris, May 2nd, 1872.

By M. SCHLOSS.
A. DESNOS.

(Signed)

Paris, June 16th, 1887.
Certified copy.
[Seal of the Bureau of Industrial Property.]

W. DETREUY.

DEFENDANT'S EXHIBIT SCHLOSS ENGLISH PATENT. A. E. L., Sp'l Ex'r.

No. 1450 of 1870.

Fastenings for Purses, &c.

Letters patent to Joseph Schloss, of No. 46, Cannon street, in the city of London, for the invention of "improvements in fastenings applicable to purses and such like articles."—A communication from abroad by Paul Sormany, residing at 10, Rue Charlott, Paris, in the Empire of France.

Sealed the 26th July 1870, and dated the 19th May 1870.

Provisional specification left by the said Joseph Schloss at the office of the commissioners of patents, with his petition, on the 19th May 1870.

I, Joseph Schloss, of No. 46, Cannon street, in the city of London, do hereby declare the nature of the said invention for "improvements in fastenings applicable to purses and such like articles," to be as follows:—

This invention has for its object improvements in fastenings applicable to purses and such like articles.

329 The improved fastening consists of two parts, a button or stud fixed to one flap or part of the purse or other article to which the fastening is applied, and the other a plate with a hole in it fixed to the other flap or part thereof. The head of the button or stud is somewhat larger than its stem, and has slits or saw-cuts made in it in such manner that when it is forced through the hole in the plate the parts of the head may yield slightly and afterwards again separate. The hole in the plate is made taper to allow the free entry of the head of the button or stud, and around its margin radial slits are formed dividing the metal around the hole into a number of teeth which yield or spring to allow the head of the button or stud to enter between them as it is pressed through the hole in the plate, and then return and hold around the stem of the button or stud sufficiently firmly to keep the purse or other article securely closed. The parts of the fastening can be separated to open the purse or other article by the application of a moderate force. The button or

stud and the plate may be fixed to the parts to be held together by rivets or screws, or in other convenient way.

Specification in pursuance of the conditions of the letters patent, filed by the said Joseph Schloss in the Great Seal Patent Office on the 18th November 1870.

To all to whom these presents shall come, I, Joseph Schloss, of No. 46, Cannon street, in the city of London, send greeting.

Whereas her most excellent majesty Queen Victoria, by her letters patent, bearing date the nineteenth day of May, in the year of our Lord one thousand eight hundred and seventy, in the thirty-third year of her reign, did, for herself, her heirs and successors, give and grant unto me, the said Joseph Schloss, her special license that I, the said Joseph Schloss, my executors, administrators, and assigns, or such others as I, the said Joseph Schloss, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel islands, and Isle of Man, an invention for "Improvements in fastenings applicable to purses and such like articles," a communication from Paul Sormany, a person resident at 10, Rue Charlott, Paris, in the Empire of France, upon the condition (amongst others) that I, the said Joseph Schloss, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said letters patent.

Now know ye, that I, the said Joseph Schloss, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say:—

This invention has for its object improvements in fastenings applicable to purses and such like articles.

The improved fastening consists of two parts, a button or stud fixed to one flap or part of the purse or other article to which the fastening is applied, and the other a plate with a hole in it fixed to the other flap or part thereof. The head of the button or stud is somewhat larger than its stem, and has slits or saw-cuts made in it in such manner that when it is forced through the hole in the plate the parts of the head may yield slightly and afterwards again separate. The hole in the plate is made taper to allow the free entry of the head of the button or stud, and around its margin radial slits are formed dividing the metal around the hole into a number of teeth which yield or spring slightly to allow the head of the button or stud to enter between them as it is pressed through the hole in the plate, and then return and hold around the stem of the button or stud sufficiently firmly to keep the purse or other article securely

A. D. 1870, May 13. N° 1450.
SCHLOSS' SPECIFICATION.

(1 SHEET)

FIG. 9. FIG. 8. FIG. 10

FIG. 5. FIG. 4. FIG. 6.

FIG. 2. FIG. 1.

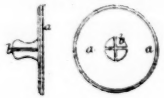

FIG. 11.

FIG. 7.

FIG. 3.

FIG. 12.

No. 289.
B'ds. Fastener Co.
v.
Kraetzer.
} p. 331 a

The filed drawing is partly colored.

closed. The parts of the fastening can be separated to open the purse or other article by the application of a moderate force. The button or stud and the plate may be fixed to the parts to be held together by rivets or screws, or in other convenient way.

In order that the said invention may be most fully under-
331 stood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

Description of the Drawings.

(Here follows diagram marked p. 331*a*.)

Figure 1 is a plan, figure 2 is a side view, and figure 3 is an under side view of the button or stud forming one part of the fastening; it consists of a disc or base plate *a* with the projection *b* rising from it. The head of the projection is somewhat larger than the neck, and both are divided by cross saw cuts dividing them into parts, having a certain amount of elasticity and capable of yielding inwards one towards the other on the application of a sufficient pressure. The plate *a* is fixed to the purse or other article by small rivets *c*, *c*, passing through it and through a plate or disc on the other side of the fabric, or it may be fixed in other convenient manner.

Figure 4 is a plan, figure 5 a side view, figure 6 a section, and figure 7 an under-side view of the plate to receive the button or stud, and which is affixed to the other side or flap of the purse or article. It has a hole *d* in the centre, the edges of which are serrated, the metal not being moved to form the hole but being displaced so as to produce a number of inclined teeth round its edge, as the drawing shews. These teeth are more or less elastic, and yield to some extent to admit of the passage of the head of the button or stud between them. This plate may be secured to the flap or part of the purse or other article by rivets in the manner described in respect to the plate *a*, except that the plate or disc on the other side will in this case have a hole through it corresponding with the hole *d*; this plate may however be fixed in any convenient manner. I prefer usually to form upon it a cylindrical projection *e*, having a fine screw-thread cut within it. This is inserted into a hole formed in the flap or part of the purse or article, and on the other side a cap or cover piece is screwed into it. The plan of this piece is shewn at figure 8, a side view at figure 9, a section at figure 10, and an under side view at figure 11; the projection *f* in this part has a thread cut upon it externally corresponding to that within the projection *e*. The hole *d* is adapted as the drawing shows to receive a turn-screw to be used in screwing the parts together.

332 Figure 12 is a section of the several parts of the fastening combined the one with the other. This fastening is applicable to a great variety of articles, for example, to gloves, gaiters, leggings and stays. In most cases it will be made to a scale smaller than that of the drawings, and adapted to the article to which it is

to be applied. The parts are not necessarily circular in outline, they may be oval, square, or other forms.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that what I claim is the construction of fastenings substantially as described.

In witness whereof, I, the said Joseph Schloss, have hereunto set my hand and seal, this eighteenth day of November, in the year of our Lord one thousand eight hundred and seventy.

JOSEPH SCHLOSS. [L. S.]

DEFENDANT'S EXHIBIT BAYER ENGLISH PATENT. A. E. L., Sp'l Ex'r.

No. 809 of 1877.

Dress Fastening.

Letters patent to Charles Bayer, of St. Marylebone, in the county of Middlesex, for the invention of "an improved fastening for corsets, dresses, gloves, and other wearing apparel." A communication from abroad by Messrs. Delpy and Lemaire, of Paris, France.

Sealed the 10th August 1877, and dated the 28th February 1877.

Provisional specification left by the said Charles Bayer at the office of the commissioners of patents on the 28th February 1877.

Charles Bayer, of St. Marylebone, in the county of Middlesex. "An improved fastening for corsets, dresses, gloves, and other wearing apparel." A communication from abroad by Messrs. Delpy and Lemaire, of Paris, France.

333 My invention relates to an improved fastener for wearing apparel, such as corsets or stays, bodices, dresses, gloves, gaiters, boots, and shoes.

This improved fastener is of small cost to manufacture, neat in appearance, and convenient for use, as it may be readily fastened and unfastened. It consists of two parts, the one an ordinary stud with a small head riveted or otherwise fixed on and projecting from the front surface of the one part of the article of dress to be secured. The other part of the fastener, to which my invention more particularly relates, consists of a hollow dome resembling a button head stamped up in thin metal and fixed on the front surface of the other part of the article, and combined with a small metal plate perforated and stamped up to resemble an eyelet, which is fixed on the back or under surface of the article. The dome and eyelet mutually retain one another, being firmly secured together by fangs or tongues of metal stamped out with the dome, and passed through holes in the eyelet, and riveted or bent down over the same in recesses provided for their reception.

In using the fastener the stud above referred to is received in the eyelet which takes under the head of the stud, sufficient space being

A.D.1877. Feb. 28. Nº 509.
BAYER'S Specification.

(1 SHEET)

No. 289.
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p. 334

FIG. 1.

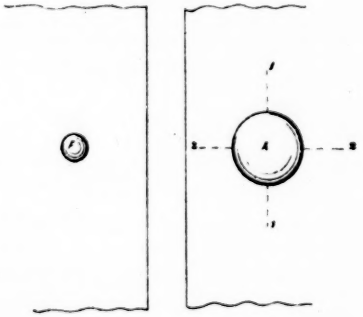

FIG. 5.

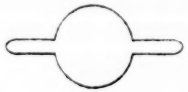

FIG. 6.

FIG. 3.

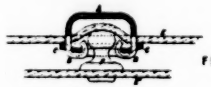

FIG. 4.

FIG. 2.

FIG. 7.

The filed drawing is not coloured.

afforded by the hollow dome and the convex form of the eyelet for the head of the stud without cutting any hole in the fabric or article.

Specification in pursuance of the conditions of the letters patent filed by the said Charles Bayer in the Great Seal Patent Office on the 22nd August 1877.

Charles Bayer, of St. Marylebone, in the county of Middlesex. "An improved fastening for corsets, dresses, gloves, and other wearing apparel." A communication from abroad by Messrs. Delpy and Lemaire, of Paris, France.

This invention relates to an improved fastener for wearing apparel, such as corsets or stays, bodices, dresses, gloves, gaiters, boots, and shoes.

The improved fastener is of small cost to manufacture, is easily applied, neat in appearance, and convenient for use. It consists of two parts, the one being an ordinary stud fixed to the one
334 part of the article of dress, and the other consisting of a hollow dome applied on the front surface of the other part of the article of dress, and combined with a sort of eyelet at the back or under surface of the article, the dome and eyelet being firmly united with the fabric or article between them by fangs or tongues stamped out with the dome and passed through holes in and turned down over the eyelet. It is the construction of this part of the fastener that constitutes the invention.

In use the head of the stud passes through and engages with the eyelet, sufficient space being afforded for the reception of the head by the hollow dome and the convex form of the eyelet without cutting a hole in the fabric or article.

Description of Drawings.

The annexed drawings represent the improved fastener on an enlarged scale.

(Here follows diagram marked p. 334*a*.)

Figure 1 is a face view showing the two parts of the fastener as applied to a portion of the article of dress; figure 2 is an underside view showing the eyelet; figures 3 and 4 are vertical sections taken on lines 1—1, 2—2, figure 1, respectively, representing the two parts of the fastener connected as in use; figure 5 represents the metal blank from which the dome is stamped up to the form shown in section in figure 6; and figure 7 represents the eyelet separately.

A is the dome provided with two fangs B, B, at opposite sides; C is a perforated metal plate stamped up of a slightly convex form like an eyelet. It is provided with two holes D for the fangs B to pass through, and is divided at one side C^1 to enable it to spring slightly when the stud is inserted. The dome A is fixed on the

front surface and the eyelet C on the back surface of the portion E of the article of wearing apparel, and the two are firmly connected by the fangs B being passed through holes in the fabric E and through the holes D, and turned over and received in recesses D^1 in the inner edge of the eyelet, as shown in figure 3. F is an ordinary stud rivetted or otherwise fixed on the other part E^1 of the article and projecting from the front surface thereof. It has a rounded head of such diameter that it will just pass between the
335 fangs D by springing the eyelet slightly. The dome A is, together with the tongues B, punched out of sheet metal in the form of the blank represented in figure 5. This blank is then cupped by a pair of forcing tools, and brought to the form shown in figure 6. The eyelet is also punched out of sheet metal perforated and brought to the form shown by suitable punches and dies.

Having described the nature of the said invention and the manner of performing the same, I declare that what I claim as the invention to be protected by the hereinbefore in part recited letters patent is, the combination of the dome A or its equivalent and the eyelet C applied on opposite sides of the fabric and united by fangs, substantially as herein shown and described, for use in connection with a stud, as and for the purpose specified.

In witness whereof, I, the said Charles Bayer, have hereunto set my hand and seal this fifteenth day of August, in the year of our Lord one thousand eight hundred and seventy-seven.

CHARLES BAYER. [L. S]

DEFENDANT'S EXHIBIT VOGL ENGLISH PATENT. A. E. L., Sp'l Ex'r.

No. 2590 of 1862.

Fastenings for Leggings, &c.

Sealed the 17th March 1863, and dated the 22nd September, 1862.

Letters patent to Maurice Vogl, of Sambrook Court, Basinghall street, in the city of London, merchant, for the invention of "improvement in fastenings for leggings and other articles of wearing apparel."

Specification in pursuance of the conditions of the letters patent, filed by the said Maurice Vogl in the Great Seal Patent Office on the 21st March, 1863.

To all to whom these presents shall come I, Maurice Vogl, of Sambrook Court, Basinghall street, in the city of London, merchant, send greeting.

336 Whereas her most excellent majesty Queen Victoria, by her letters patent, bearing date the twenty-second day of September, in the year of our Lord one thousand eight hundred and sixty-two, in the twenty-sixth year of her reign, did, for herself, her heirs and successors, give and grant unto me, the said Maurice Vogl,

her special license that I, the said Maurice Vogl, my executors administrators, and assigns, or such others as I, the said Maurice Vogl, my executors administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel islands, and Isle of Man, an invention for "improvements in fastenings for leggings and other articles of wearing apparel," upon the condition (amongst others) that I, the said Maurice Vogl my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said letters patent.

Now know ye, that I, the said Maurice Vogl, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, reference being had to the accompanying drawings, and to the letters and figures marked thereon that is to say:—

My invention consists in constructing fastenings as follows:—According to my first arrangement I construct a fastening, of which one portion or member is a pin, stud, or piece having a head, outer end, limb, or part broader than or projecting from its stem, shank, or body. This pin, stud, or piece is capable of turning wholly or partly round. The other member or portion of the fastening is a slot or opening, preferably edged or protected by a metal eyelet or rim. To effect the fastening the pin or turning piece is introduced into the slot or opening, and turned sufficiently to bring its head, outer end, or projecting limb at an angle to the length of the
337 opening, or over its edge or side, in which position the members of the fastening are engaged. To disengage them, the pin or turning piece is turned so as to bring its end, head, or limb in such position with regard to the slot or opening that it can be slipped through the same. Or, in a second arrangement I use instead of the pin, stud or turning piece a spring or springs, of such shape and arrangement that when compressed it or they may be passed through the slot or opening, but when released or allowed to extend or return to its or their previous form, the arms or sides of the spring will project or extend over the sides or edges of the slot or opening, and effect the fastening. The spring may if desired, be capable of turning wholly or partially round.

The accompanying drawings exemplify the manner of performing my invention.

Figures 1 to 5, inclusively, relate to the first arrangement. Figure 1 shews the fastening applied by way of example to a portion of a legging A. It may be applied in like manner to other articles of apparel. Figure 2 is an elevation of the fastening closed; figure 3 is a transverse section of figure 1, shewing the fastening closed and

figure 4, a transverse section shewing it unfastened; figure 5 shews the parts separately.

a is the pin or turning piece, and a^1 its head; the pin is capable of being turned round in the legging. In the best mode of fitting it for the purpose, the pin is formed with a collar or shoulder a^2, and is passed through the leather or material of the legging and through an inner steel plate a^3, and a disc a^4 is fastened on its inner end; the pin is fitted near one edge of the legging; b is a slot formed in the legging near the other edge, and surrounded by a metal eyelet b^1 this slot is of sufficient length to admit the pin head a^1 when the latter is turned in the direction of the slot's length, but the slot is too narrow for the pin head a^1 to pass through when turned transversely, diagonally, or at an angle to the slot's length. Thus the fastening can be opened and closed by turning the pin a. To close the fastening, the pin head a^1 having first been brought lengthwise of the slot, is passed through it and is then turned across it, as shewn in figures 1, 2 and 3. To open the fastening the
338 pin head a^1 is brought lengthwise of the slot, as shewn in figure 4, and the slot can then be readily withdrawn from the pin. For leggings I prefer to use three or more fastenings, their slots b being so formed that the direction of each shall be at a right angle to that of the next.

Figures 6 to 10, inclusively, refer to the second arrangement of fastening, in which a spring is used instead of a pin a, a^1; b is the slot, and b^1, eyelet as before; c, c, are two springs, consisting as in the section, figure 9, of bent wires, or as in the section figure 6, and elevation figure 7, of cup-shaped or hollow hemispherical pieces of steel or springy metal attached to stems c^1 soldered at their inner ends, and attached to the legging, but kept oblique by a projection c^2. b, figure 8, is the slot for the springs, figure 6; b, figure 10, is the slot for springs figure 9. When the slot b passes over the springs it will compress them, and when the springs are through they will be released, and extend to their previous form, and thus close the fastening, as shewn in figure 7; the fastening is opened by withdrawing the slot from the springs.

Having now described the nature of my said invention, and in what manner the same may be performed, I declare that I claim as the invention secured to me by the said letters patent,—

First, a fastening having its parts arranged and combined according to the first arrangement, hereinbefore described.

Second, a fastening having its parts arranged and combined according to the second arrangement, hereinbefore described.

In witness whereof, I the said Maurice Vogl, have hereunto set my hand and seal, this twentieth day of March, in the year of our Lord one thousand eight hundred and sixty-three.

MAURICE VOGL. [L. S.]

Witness.

M. HENRY,

Patent Agent, 84 *Fleet Street, London.*

M. B. H. L. B. R.

339 DEFENDANT'S EXHIBIT DOWLER ENGLISH PATENT. A. E. L., Sp'l Ex'r.

No. 795 of 1883.

Fastenings for Purses, &c.

Letters patent to Frederick Dowler and Henry Dowler and Frederick Dowler the younger all of Aston near Birmingham in the county of Warwick manufacturers, for an invention of improvements in fastenings for purses bags gloves leggings boots and other articles of wearing apparel.

Provisional specification left by the said Frederick Dowler, Henry Dowler, and Frederick Dowler the younger at the office of the commissioner of patents on the 13th February 1883.

Frederick Dowler and Henry Dowler and Frederick Dowler the younger all of Aston near Birmingham in the county of Warwick manufacturers "improvements in fastenings for purses bags gloves leggings boots and other articles of wearing apparel."

Our invention relates to such fastenings as consist essentially of a stud fixed on one of the two parts of the article to be fastened together and an eye fixed on the other part the said stud being engaged in and disengaged from the said eye by gentle pressure. Our improvements consist in constructing and attaching the said parts of the fastenings in the ways hereinafter described.

We will describe our invention as applied to the fastening of a glove. We make the stud preferably of metal the said stud consisting of a stem terminating at top in a head and terminating at bottom in a flange. The head is separated from the stem by a neck or slightly contracted part. The stud described is either solid or hollow and is made from sheet metal or wire by ordinary raising and shaping processes and tools.

The stud is attached to one edge of the open wrist part of the glove by sewing or by eyeletting. Or it may be attached by a thin metallic cap having teeth or serrations on its edges. Some of
340 these serrations are turned over the flange of the stud and fix the cap thereto while others pass through the material to which the stud is attached and are turned down or clinched on its upper side. Or a detached serrated cap may be employed or the flange of the stud may have serrations for the purpose of attaching it to the article.

In some cases we make the stem of the stud conical at its lower part and cover the flange with a loose-fitting cap. In attaching this stem we pass its head from the back through a hole in the material and force an eyelet down the conical stem. The eyelet is expanded and the expanded part passes between the flange and loose-fitting cap. The head of the eyelet grips the material between itself and the cap at the back of the material and thereby secures the stem in its place.

Our improvements in the eye part of the fastening are as follows we make the said eye of sheet brass or other hard metal or alloy raised or shaped into the figure of a dome or inverted cup having at its mouth a flange there being a slight contraction near the flange. We cut away portions of the flange and the sides of the cup near the flange the uncutaway parts constituting opposed elastic arms. This cup is of a size suitable for the reception of the head of the stem the said stem when pressed into the said cup being gripped at its neck by the spring arms. The said eye may be attached to the article in various ways. In some cases we attach it to an eyelet by means of a separate collar. By pressure this collar is fixed to the head of the eyelet and retains the eye in its place without affecting its elasticity. The eye thus secured to the eyelet is fixed to the article by clinching the eyelet in a hole in the article. Or the eye may be covered by a dome the edge of which is joined to the head of the eyelet.

Or the flange of the eye may have prongs which are passed through the article and clinched upon a plate of metal having holes through which the prongs pass. This plate is perforated at its middle to allow of the passage of the stem of the fastening.

The stem and eye are attached at points opposite each other on the two parts of the glove or article to be fastened. The stem is inserted in the eye and pressed home therein. Its head having passed the lower ends of the spring arms the said arms snap
341 into the neck and hold the stem in the eye. To separate the parts or to withdraw the stem from the eye it is only necessary to raise the part of the article having the eye with sufficient pressure to overcome the contraction of the eye upon the stem when the latter can be withdrawn from the former and the two parts of the article separated.

In some cases we perforate the cup or dome forming the eye so as to permit of the passage of a projection on the top of the stem passing through and standing above the level of the top of the eye. Pressure on this projection facilitates the disengagement of the stem from the eye.

The cutting away of parts of the flange and sides of the eye may be dispensed with as the said eye will grip the stem in the absence of these cuttings. The action is however more efficient when the eye has the said cuttings.

The application of our invention to purses bags leggings boots and other articles of wearing apparel differs in no essential respect from its application to gloves as herein described.

Specification in pursuance of the conditions of the letters patent filed by the said Frederick Dowler, Henry Dowler, and Frederick Dowler the younger in the Great Seal Patent Office on the 3rd August, 1883.

Frederick Dowler and Henry Dowler and Frederick Dowler the younger all of Aston near Birmingham in the county of Warwick, manufacturers. "Improvements in fastenings for purses, bags, gloves, leggings, boots and other articles of wearing apparel."

Our invention relates to such fastenings as consist essentially of a stud fixed on one of the two parts of the article to be fastened together and an eye fixed on the other part the said stud being engaged in and disengaged from the said eye by gentle pressure. Our improvements consist in constructing and attaching the said parts of the fastenings in the ways hereinafter described.

We will describe our invention as applied to the fastening
342 of a glove. We make the stud preferably of metal, the said stud consisting of a stem terminating at top in a head and terminating at bottom in a flange. The head is separated from the stem by a neck or slightly contracted part. The stud described is either solid or hollow and is made from sheet metal or wire by ordinary raising and shaping processes and tools.

The stud is attached to one edge of the open wrist part of the glove by sewing or by eyeletting. Or it may be attached by a thin metallic cap having teeth or serrations on its edges. Some of these serrations are turned over the flange of the stud and fix the cap thereto while others pass through the material to which the stud is attached and are turned down or clinched on its upper side. Or a detached serrated cap may be employed; or the flange of the stud may have serrations for the purpose of attaching it to the article. In some cases, we make the stem of the stud conical at its lower part and cover the flange with a loose-fitting cap. In attaching this stem we pass its head from the back through a hole in the material and force an eyelet down the conical stem. The eyelet is expanded and the expanded part passes between the flange and loose-fitting cap. The head of the eyelet grips the material between itself and the cap at the back of the material and thereby secures the stem in its place.

Our improvement in the eye part of the fastening are as follows:— We make the said eye of sheet brass or other hard metal or alloy raised or shaped into the figure of a dome or inverted cup having at its mouth a flange, there being a slight contraction near the flange. We cut away portions of the flange and the sides of the cup near the flange, the uncutaway parts constituting opposed elastic arms. This cup is of a size suitable for the reception of the head of the stem, the said stem when pressed into the said cup being gripped at its neck by the spring arms. The said eye may be attached to the article in various ways. In some cases we attach it to an eyelet by means of a separate collar. By pressure this collar is fixed to the head of the eyelet and retains the eye in its place without affecting

its elasticity. The eye thus secured to the eyelet is fixed to the article by clinching the eyelet in a hole in the article. Or
343 the eye may be covered by a dome, the edge of which is joined to the head of the eyelet.

Or the flange of the eye may have prongs which are passed through the article and clinched upon a plate of metal having holes through which the prongs pass. This plate is perforated at its middle to allow of the passage of the stem of the fastening.

The stem and eye are attached at points opposite each other on the two parts of the glove or article to be fastened. The stem is inserted in the eye and pressed home therein. Its head having passed the lower ends of the spring arms the said arms snap into the neck and hold the stem in the eye. To separate the parts or to withdraw the stem from the eye, it is only necessary to raise the part of the article having the eye with sufficient pressure to overcome the contraction of the eye upon the stem when the latter can be withdrawn from the former and the two parts of the article separated.

In some cases we perforate the cup or dome forming the eye so as to permit of a projection on the top of the stem passing through and standing above the level of the top of the eye. Pressure on this projection facilitates the disengagement of the stem from the eye.

The cutting away of parts of the flange and sides of the eye may be dispensed with as the said eye will grip the stem in the absence of these cuttings. The action is however more efficient when the eye has the said cuttings.

We will now proceed to describe with reference to the accompanying drawings the manner in which our invention is to be performed.

(Here follow diagrams marked pp. 343*a* and 343*b*.)

Figure 1 represents a portion of a glove to which fastenings constructed according to our invention are applied, *a* being the stud part of the fastening fixed on the edge *c* of the glove and *b* the eye part of the fastening fixed on the opposite edge *d* of the glove; figure 2 represents in section the stud part of the fastening and portion of the glove and figure 3 represents in section the eye part of the fastening and portion of the glove, the said figures 2 and 3 and the other figures exhibiting parts of the same being drawn to a larger scale; figure 4 represents in section the stud part engaged with the eye part; figure 5 represents the stem of the stud separately and figure 6 represents portions of the eye part separately.

344 The stud part of the fastening consists of a hollow stem (but the stem may be made solid) having at top a head *a*. The lower part a^2 of the stem is conical and terminates in a flange a^3 (see figure 5). Between the head and conical base of the stem is a neck or slightly contracted part *e* as represented. The stem is closed at bottom by a cap *f* in which the flange a^3 fits loosely.

A.D. 1883. Nov. 12. N° 798.
F., E. & F. DOWLER. Jun^r Specification.

No. 289.
B. & S. Festiniog Co. } p. 343 a
Kraetzer.

(2 SHEETS) SHEET 1.

FIG. 1.

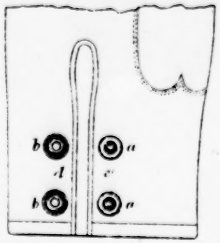

FIG. 6.

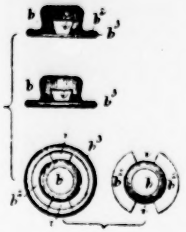

FIG. 8.

FIG. 13.

FIG. 9.

FIG. 14.

FIG. 5.

FIG. 10.

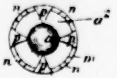

FIG. 15.

FIG. 3.

FIG. 2.

FIG. 7.

FIG. 4.

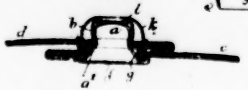

FIG. 11.

FIG. 16.

FIG. 12.

A.D. 1868. Pat. 13. Nº 798.
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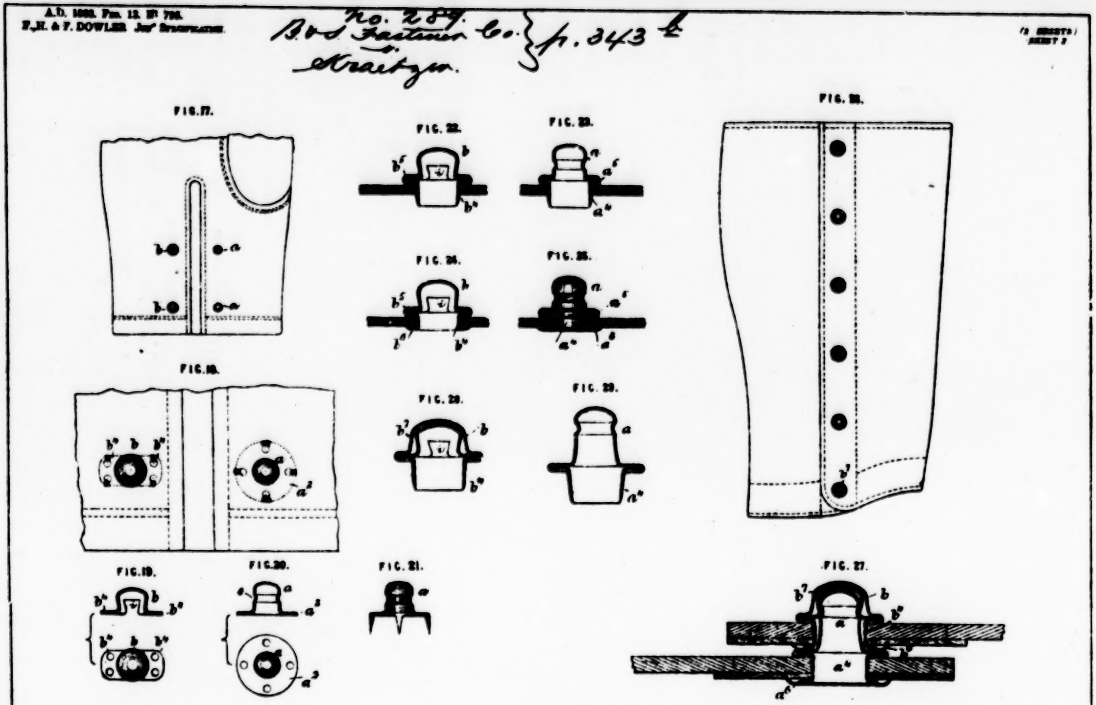
Heaitzyn.



In attaching the stud to the glove its head *a* is passed from the back through a hole in the material and an eyelet *g* (shown separately in section in figure 2) is forced down the conical base part a^2 of the stem. The barrel of the eyelet is thereby expanded and the expanded part made to pass between the flange and loose-fitting cap *f* and cause the material of the glove to be gripped between the face or flange of the said eyelet *g* and cap *f* as shown in the sectional views figures 2 and 4. The stud is thereby fixed to the glove.

The eye figure 3 of the fastening consists of a dome or inverted cup *b* perforated at top and having at its mouth a flange b^2 the dome or cup *b* being slightly contracted at *h* near the said flange.

The edge of the flange b^2 is covered by a ring b^3 which acts as a guard to prevent the straining of the eye. Portions of the flange b^2 and sides of the cup *b* near the flange are cut away at opposite points as best seen in the section, side elevation and plan of upper side of the dome or cup in figure 6, the said figure 6 also exhibiting a plan of the dome or cup without its ring. The cut-away parts in the flange and cup are marked *i*, *i*. The uncutaway parts of the dome or cup constitute opposed elastic arms.

A space is left between the edge of the flange b^2 of the dome or cup and ring b^3 to permit of the expansion of the said dome when the stud is inserted or withdrawn.

The dome or cup of the eye part of the fastening is fixed to the material of the glove in the manner illustrated in figure 3; that is, the dome or cup is passed through a hole in the material from the back thereof, so that its ring b^3 bears on the under side of the material. The dome or cup *b* on the upper side of the material is then covered with a dome-shaped cap *k* the upper edge of which is eyeletted around the hole in the top of the dome or cup *b* as seen in figures 3 and 4 and marked *l*. By the eyeletting of the cap *k* the material is gripped between the base of the said cap *k* and the ring b^3 at the mouth of the dome or inverted cup *b*.

In order to fasten together the two edges of the glove the stem *a* of the stud part of the fastening is pressed home in the dome or cup *b* of the eye part. As the head of the stem passes the narrow end or mouth *h* of the said dome or cup the spring arms of the said cup are expanded and when the stem has been fully pressed home the said stem is gripped by the snapping of the spring arms of the cup upon the neck or contraction of the stem as seen in figure 4 and the two edges of the glove are connected together.

By raising the material carrying the eye part *b* with a pressure sufficient to overcome the contraction of the cup upon the stem, the two parts of the fastening may be disconnected from one another.

Although we prefer to cut away the parts of the flange and sides of the cup or dome *b* of the eye part as described and represented yet the said dome or cup may be used without cut-away parts as represented in section and plan in figure 7.

The strengthening ring b^3 of the cup or dome may be dispensed with and the material gripped directly between the flange b^2 of the cup *b* and the base of the dome-shaped cap *k*, figures 3 and 4.

The top of the head *a* of the stud part may be furnished with a

projection for passing through the perforated top of the cup or dome *b* of the eye part as represented in figure 8. When the two parts of the fastening are connected together the projection of the stud *a* stands above the level of the top of the eye part *b* as represented and pressure upon the said projection facilitates the disengagement of the stem from the eye.

Instead of eyeletting the stud part to the material of the glove it may be fixed by teeth or serrations in the manner represented in elevation in figure 9; plan of upper side in figure 10 and connected to the material in figure 11. In this modification the flange at the base of the stud *a* is placed in a thin metallic cap *m* having teeth or serrations on its edge marked *n*, *n* and *p*, *p*. The teeth *p* are turned over the flange a^2 of the stud *a* and fix the cap *m* thereto as seen in the plan figure 10, while the other teeth *n*, *n* are
346 passed through the material from the back and are turned down or clinched on the upper side of the said material as represented in figure 11.

Or a loose cap as represented in figure 12 may be used. In this case the flange of the stud is placed in the loose cap *r* and the teeth *q* are passed through the material and clinched on the upper side thereof in the same manner as the teeth *n*, *n* of the arrangement, figures 9, 10 and 11; or the separate cap may be dispensed with and the flange of the stud have serrations or teeth made upon it for attaching the stud to the material as represented in figure 13, where the teeth on the flange before they are clinched are marked *s*, *s*.

The eye part of the fastening may be fixed in a similar manner as illustrated in figures 14 and 15, where *t*, *t* are the teeth at the edge of the flange b^2 of the cup *b* which teeth are passed through the material from the back and clinched upon a washer *u* at the front of the material as represented in figure 15.

Figure 16 represents in section the stud part figure 13 (after the teeth *s s* have been clinched) engaged with the eye part figure 15.

Figure 17 represents a portion of a glove to which fastenings constructed according to our invention are applied; figure 18 represents a portion of the same drawn to a larger scale; figure 19 represents in section and plan the eye part of the fastening detached and figure 20 represents in section and plan the stud part of the fastening detached.

In this modification the parts of the fastening are attached to the two edges of the glove by sewing. For this purpose, the flange of the cup or dome *b* of the eye part forms ears b^4, b^4 which are pierced. By means of the pierced ears b^4, b^4 the eye part of the fastening is attached by sewing to the glove.

The stud part *a* of the fastening has a pierced flange a^2 by which it is attached by sewing to the glove as represented.

Or teeth may be made on the flange of the stud part for attaching it by clinching the said teeth to the glove, as represented in figure 21.

Figure 22 represents in section the eye part and figure 23 in section the stud part of another glove-fastening constructed according to our invention.

347 Figures 24 and 25 represent the said eye and stud parts connected to the edges of the glove.

In this modification the cut-away dome or cup b of the eye part has an eyelet b^4 secured to it at its mouth by the ring b^5 being closed upon the flange of the said dome or cup and the flange of the eyelet as represented, a space being left between the ring b^5 and the flange of the dome or cup b to permit of the expansion of the said cup when the stud is introduced into it.

The ring b^5 acts as a strengthening ring to the eye in the same manner as the ring b^3 figures 3, 4 and 6. The stem part a has a similar eyelet a^4 and ring a^5 but the ring a^5 is closed tightly upon the flanges of the eyelet and stem as represented. The two parts figures 22 and 23 of this glove-fastening are attached to the glove by passing their eyelets b^4, a^4 from the front through holes in the glove and eyeletting the lower projecting parts of the said eyelets upon rings b^6, a^6 on the under side of the glove as represented in figures 24 and 25.

Figure 26 represents a fastened legging provided with fastenings constructed according to our invention and figure 27 represents a cross-section of the same taken through one of the fastenings, drawn to a larger scale.

Figure 28 represents the eye part of the fastening and figure 29 the stud part of the fastening before they are attached to the legging.

This fastening resembles generally the glove-fastening last described excepting that the ring b^5 by which the flanges of the cup or dome b and eyelet b^4 of the eye part are connected together is replaced by a cap or dome b^7 by which the perforated top of the cup b is covered (see figure 28). The other parts of the eye and stud parts of the legging fastening are substantially the same as corresponding parts of the glove-fastening last described and are marked with the same letters of reference.

The application of our invention to purses bags boots and shoes and other articles of wearing apparel differs in no essential respect from its application to gloves and leggings hereinbefore described and illustrated in the accompanying drawings.

Having now described the nature of our invention and the manner in which the same is to be performed we wish it to be
348 understood that we claim as our invention of "improvements in fastenings for purses bags, gloves, leggings, boots and other articles of wearing apparel."

First—Making the stud part of the fastening of a stem having in combination the following parts, namely, a head a, a conical base a^2 with a flange a^3, covered with a loosely fitting cap f, and a neck or contraction e between the head and conical base as hereinbefore described and illustrated in figures 1, 2, 4 and 5 of the accompanying drawings, whether the said stem be made from sheet metal or from wire. Also fixing the said stud to the material by means of a separate eyelet in the manner hereinbefore described and illustrated in the accompanying drawings.

Secondly—Making the eye part of the fastening of the figure of a

dome or inverted cup, perforated or unperforated at top, having at its contracted mouth a flange, parts of the said dome or cup and its flange being cut away for the purpose hereinbefore described and illustrated in the accompanying drawings also the modification hereinbefore described and illustrated in figure 7 in which the dome or inverted cup is without cut-away parts in its sides and flange.

Thirdly—The addition to the head of the stud part of the fastening of the projection represented in figure 8 to be used in combination with a perforated eye part, whereby the disengagement of the two parts of the fastening by pressure on the said projection is facilitated.

Fourthly—The modification of the fastening hereinbefore described and illustrated in figures 17, 18, 19 and 20 of the accompanying drawings in which the stud and eye parts of the fastenings are secured to the glove or other article by sewing.

Fifthly—The methods of fixing the eye part of the fastening to the material hereinbefore described and illustrated in figures 3, 4, 8, 14, 16, 22, 24, 27 and 28 of the accompanying drawings.

In witness whereof we the said Henry Dowler and Frederick Dowler the younger have hereunto set our hands and seals this first day of August in the year of our Lord one thousand eight hundred and eighty-three.

HENRY DOWLER [L. S.]
FREDERICK DOWLER JUN. [L. S.]

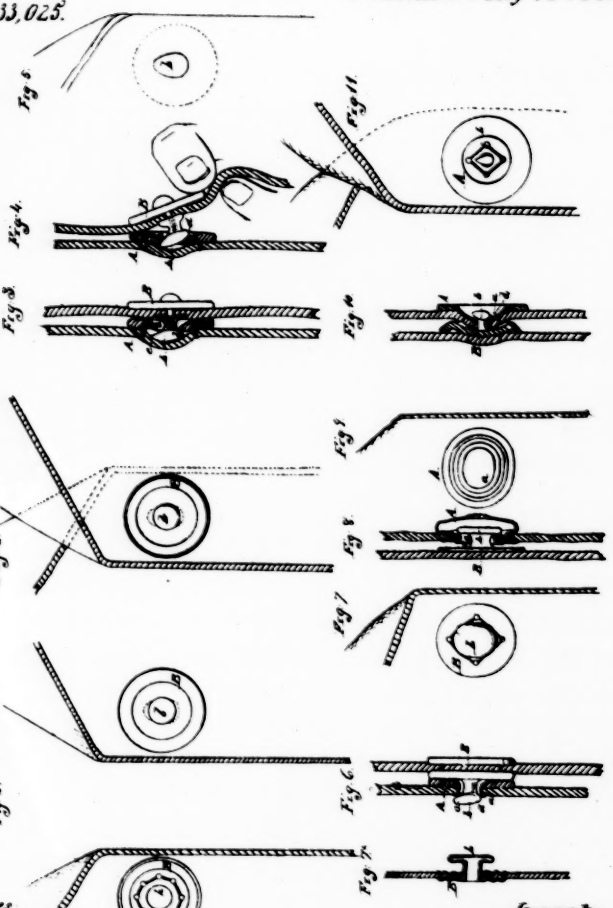
Witness,
GEORGE SHAW.

R. Boeklen & W. Stachlen.

Button.

No 2,021
33,025.

Patented Aug 13 1861



Witnesses
Frederick Smith

Inventor
R. Boeklen
W. Stachlen

349 DEFENDANT'S EXHIBIT BOEKLEN AND STACHLEN PATENT.
A. E. L., Sp'l Ex'r.

Letters patent of the United States No. 33025 granted R. Boeklen and W. Stachlen, Aug. 13, 1861.

Button.

Specification.

To all whom it may concern:

Be it known that R. Bocklen and W. Stachlen both of Brooklyn in the county of Kings and State of New York have invented a new and useful improvement in garment fasteners, and we do hereby declare that the following is a full clear and exact description of the same, reference being had to the accompanying drawing making part of this specification in which

(Here follows diagram marked p. 349*a*.)

Figure 1 represents a front elevation of a coat with our improved fastening before the coat is buttoned.

Figure 2 is a similar view of the same, after the coat is buttoned.

Figure 3 is a transverse vertical section of a modification of the same when the garment is buttoned.

Figure 4 is a similar view of the same, with the garment in the act of being unbuttoned.

Figure 5 is a front elevation of another modification of the same when buttoned.

Figure 6 is a tranverse vertical section of the same.

Figure 7 is a front elevation of still another modification.

Figure 7* is a transverse vertical section of a portion of the same.

Figure 8 is a transverse vertical section of the same.

Figure 9 is an inside view of one part of the same.

Figure 10 is a transverse vertical section of the last-mentioned modification, when the garment is buttoned.

Similar letters of reference indicate corresponding parts in all the figures.

350 This invention consists in the employment or use of two disks one being attached to one and the other to the other side of a garment and one being provided with an opening while the other is furnished with a cam of peculiar form and corresponding with the opening in the first disk in such a manner that it may be introduced into the said opening when it is turned in a certain position, and that when entered, it is prevented from coming out unless brought back to the position (that in which it was introduced); so that in fact the first disk, with the opening forms a substitute for a button-hole, and the second disk, with the cam, a substitute for a button.

To enable others skilled in the art to make and use our invention we will proceed to describe it with reference to the drawing.

The disk A which takes the place of the button-hole, and which is provided with an opening, *a*, is secured to one side of a coat or other garment, either on the outside (as shown in figures 1, 2, 8 and 10), or on the inside (as shown in figures 3, 5 and 6); and it may be made of various shapes, in the form of a button, as shown in figure 1 or covered up as shown in figure 8, or with a cavity, as shown in figure 10.

The disk B which takes the place of the button, and which is provided with the cam *b* is secured to the other side of the coat, or other garment either in the ordinary manner, by means of thread and a needle, or in any other convenient manner, on the inside or on the outside; and the cam is either circular or oval, according to the form of the opening in the corresponding disk A. If the opening be oval as shown in figures 8 and 9, the cam may be made slightly oval or circular, but if the opening be round, as shown in figures 1, 2, 3, and 4, the cam only is made oval. The diameter of the cam is so proportioned in regard to the opening in the corresponding disk that it (the cam) has to be turned edgeways in order to enable it to be introduced into the opening, and when thus entered it can only be taken out if turned back to the same position in which it was entered so that the cam with the opening act precisely in the same manner as an ordinary button and button-hole.

If our device be properly attached to a coat or other garment, it can be buttoned up with the same facility as with the ordinary buttons and button-holes, and the labor necessary to make the
351 button-holes and to keep them in order is obviated. In order to render the action of the cam still more secure, we have arranged it so that its lower surface is slightly inclined as clearly shown in figures 3, 4, 6, and 10, the distance between the edge *c*, of said cam being larger than that of the edge *d*. If the cam is entered into the corresponding opening, so long as the two disks remain in parallel planes, the edge *c* of the cam will bear on the edge of the opening, as clearly shown in figures 3 and 6, and if the two disks be attached to the two sides of the garment in such a manner that the disk B will stand slightly below the disk A then the cam will be forced down towards the edge *c* and it will remain in the position clearly represented in figures 3. When thus arranged the cam will retain its position much more securely than it will if both its edges *c*, *d*, be allowed to touch the edges of the opening and should it be desired to take out the cam or in other words to unbutton the garment it (the cam) has to be brought to the position shown in figure 4 that is to say, the two disks have to be inclined towards each other more than they would have to be when the lower or inner surface of the cam is parallel to the disk to which it is attached.

This device forms a very simple cheap and durable fastening for garments, and it can be used in all places where the ordinary buttons and button-holes are used.

What we claim as new and desire to secure by letters patent is a

button or garment fastener formed by the employment or use of two disks A. B. one being provided with an opening, *a* and the other with a cam *d*, substantially in the manner and for the purpose specified.

R. BOEKLEN
W. STACHLEN.

Witnesses,
WM SINCLAIR
FREDERICK SWARTS

352 & 353 DEFENDANT'S EXHIBIT HAWLEY, FOLSOM & MARTIN'S ALTERED BILL. S. T., Sp'l Ex'r.

BOSTON, *Dec.* 24, 1888.

Ball & Socket Co. bought of Hawley, Folsom & Martin,

Importers & manufacturers of
P. F. Folsom. men's furnishing goods, 27 & 29 Otis,
Jack L. Martin. proprietors of 106 & 108 Arch St.

Plymouth Glove Works, Plymouth, N. H.

Terms 5% 30 or 6% 10 days. Telephone No. 2590.
Sales, Sold by Folsom.

---

1 pair gloves with [Kraetzer]* fasteners $1 25

Paid
HAWLEY, FOLSOM & MARTIN.

---

* Word in brackets interlined.

355 UNITED STATES PATENT OFFICE.

WILLIAM S. RICHARDSON, of Newton, assignor to Clarence John Blake, trustee, of Boston, Massachusetts.

Glove-Fastening, &c.

Specification forming part of Letters Patent No. 260,050, dated June 27, 1882. Application filed February 23, 1882. (Model.)

To all whom it may concern:

Be it known that I, William S. Richardson, of Newton, in the county of Middlesex and State of Massachusetts, a citizen of the United States, have invented a new and useful improvement in fastenings for gloves and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification in explaining its nature, in which—

(Here follows diagram marked p. 354.)

Figure 1 is a plan view of a blank from which the member of the fastening device known as the "socket" part, and adapted to be fastened to the material by an independent or separate eyelet or rivet, is formed. Fig. 2 is a plan view of a blank for the socket part, which is adapted to be fastened in place by a prong integral therewith. Fig. 3 is a plan view of a blank from which is formed the member of the fastening called the "ball" part. Figs. 4 and 5 are plan views of a portion of a glove representing the two members of the fastening engaged. Figs. 6, 7, and 8 are views in vertical section further illustrating the construction and use of the fastening. Fig. 9 is a perspective view of the two members of the fastening detached from the material and from each other. Fig. 10 is a plan of a blank of modified form. Fig. 11 is a side elevation thereof. Fig. 12 is a side elevation of the complete fastening.

The socket part of the device or fastening preferably is formed from either of the blanks A A′, the only difference between the two being that the former has the holes a, which in the complete construction are adapted to receive the fastening rivet or eyelet a', as represented in Figs. 6 and 7, while the latter has a portion, a^2, which in the complete part projects through the hole a^3, and serves as a prong by which the part is fastened in position. Aside from these distinctions, each blank has the section a^4, from which the center has been removed, leaving a section which is circular excepting at two points, and which is struck up to form the socket, and the section a^5, which forms the seat of the device. It is practically immaterial so far as the steps in the process of forming the metal into the complete socket part of the device are concerned whether the blank be thus prepared or whether it be first shaped as shown in Figs. 10 and 11, the sequence of the various manipulations necessary in

No. 289.
B. & S. Fastener Co. } p. 354.
Kraitzer

(Model.)

W. S. RICHARDSON.

GLOVE FASTENING, &c.

No. 260,050. Patented June 27, 1882.

Fig. 1.

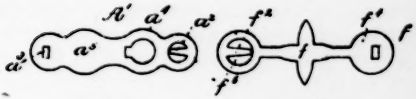


Fig. 2. Fig. 3.

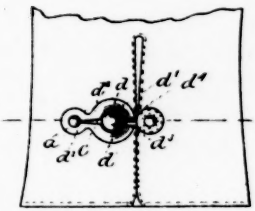


Fig. 4.

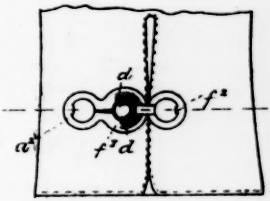


Fig. 5.

Fig. 6

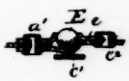


Fig. 7.

Fig. 8.

Fig. 10.

Fig. 9.

Fig. 12.

Fig 11.

WITNESSES.

Fred. Harris

H. C. Fogg

INVENTOR.

William S. Richardson.

by his atty

Charles E. Raymond

forming the part from the metal plate from which the blank is punched being susceptible of a number of variations—such, for instance, as the forming up of the portion which afterward makes the socket and cup part before the blank is punched from the metal plate, and thus removing the cap of the portion that made the socket to form the entrance or the removal of this part first before striking up the remainder to form the wall of the socket. The blank having been submitted to the action of suitable forming and shaping devices, whereby the section a^4 is struck up to form the socket B, and a slit or opening, *c*, extending from the circular opening C of the socket to the hole *a*, cut as represented in Fig. 4, and the section a^5 provided, if desired, with the cup-shaped depression c', as represented in Figs. 6, 7, and 8. The section a^5 is bent under the section a^4, as shown in said last-named figures and in Fig. 9, bringing the holes *a* or the prong a^2 and the hole a^3 in line and the cup-shaped depression beneath the socket. The complete device will therefore have the socket B, the opening to which is circular, and which has the spring or yielding sides *d*, which are adapted, on account of their being elevated above the lower edge, *d*, of the part, to have a limited amount of spring or movement in relation to said edge, the said edge being, as it were, the center or fulcrum of the movement, and also to have a further extent of spring because of the opening or slit *c* connecting the circular opening of the socket C with the hole *a*, and making each arm d^2 of the part serve as a spring-arm, permitting the sides or portions *d* to be opened. The front portion of the shell forming the socket is cut away, preferably in the blank, to form the recess d^3, into which the tongue of the other member of the fastening enters, as hereinafter explained.

The other member of the fastening device consists of a ball, E, fastened to the end of a tongue or bar, *e*, which is adapted to be secured to the material by a rivet, e', as shown in Fig. 7; or the device may be struck up from the blank shown in Fig. 3, in
356 which event the central portion, *f*, of the blank is formed into the ball f', (shown in Figs. 8 and 9,) and the blank is bent to bring the arms F F′ parallel, and so that the projection f^2 may be used as a prong in fastening the part to the material by being bent down and passed through the material and hole f^3, and turned, bent, or clinched upon the under side, as shown in Fig. 8. In securing a member of a fastening device having this construction to the material the arm F is placed over the material at or near its edge, and the other arm, F′, below it, so that the edge or portion of the material is between the two arms, and the prong or projection is pushed down through the material and clinched upon the under surface of the arm beneath. When this construction is employed I prefer to form upon the section f^4 of the blank a projection, f^5, (shown in Fig. 8,) which shall come beneath the opening f^6, and which serves two purposes—first, to lift the material to which the device is fastened to a level or very nearly to a level with its upper surface, as shown in Fig. 2; and, second, to provide a recess upon the under side, in which the end of the fastening-prong f^2 may be bent or clinched.

Of course it is immaterial for the principal purpose of the invention how the ball and tongue are fastened in place; but for purposes of economy in construction and application it may be desirable to use the construction shown in Figs. 3, 8, and 9, or at any rate to use that method of fastening the tongue and ball to the material, in which event the ball may be formed upon the tongue in the ordinary manner. The socket part may also have a projection like the projection f^5 and for the same purposes.

I prefer to fasten the socket part of the fastening to the material, substantially as shown in Figs. 6, 7, and 8.

A hole or slit, g, is formed in the material for the reception of the lower section of the device, which is slipped through the slit, as shown in Fig. 6, and the material is thus embraced between the outer ends of the lower and upper sections, while the socket is entirely upon the outside of the material. The tongue may be fastened, as shown in Figs. 6 and 7, upon the outside, or when formed as shown in Fig. 8 the two sections embrace the material.

It is desirable that the tongue and the center of the socket be as nearly on a line as possible, in order that the principal line of draft of the tongue, which is substantially a straight line, may be against the front portion of the socket, and for that reason, principally, I form the recess d for the reception of the tongue, to bring it to the desired level in relation to the center of the socket. This ball-and-socket construction of fastening is of very great advantage, because in the first instance the two parts of the fastening can readily be engaged with each other by touch. The under surface of the ball of course being smaller than the circular opening, it acts in connection with the edge thereof as a guide in locating and directing the bringing together of the parts. The parts being thus brought together, the ball is pressed into the socket against the edge of the opening, separating the sides thereof sufficiently to allow the larger part of the ball to pass below the edge of the opening, and the sides, automatically closing, then grasp the ball above the line of its greatest diameter and have an almost continuous bearing upon its surface, in effect forming a ball-and-socket joint and securely holding the ball in whatever position the tongue may stand in relation to the socket.

To remove the ball from the socket, the front portion, d^4, of the socket part, forming the under side of the recess d^3 in which the tongue rests when in its normal position, is used as a fulcrum, and by pressing the outer ends of each portion of the fastening downwardly and causing the tongue to bear on the fulcrum the ball is pried from its holding-socket.

It is obvious that this invention can be compared to a ball-and-socket joint, the distinction being that the socket has spring or yielding sides which allow the ball to be inserted and removed at will, and which hold the ball when in place; also, to a button-hole and button, the distinction in this comparison being that the button-hole or socket is metal and has spring or yielding sides, being in substance a metallic button-hole, while the ball is used very much like the ordinary button. Of course the position of these parts of

the fastening in relation to each other may be reversed in relation to the glove or other article with which they may be used without departing from the spirit of this invention, and the spring or yielding part of the device, instead of being in the sides of the socket, may be in the ball, the ball being constructed to have sides which yield automatically in relation to each other to diminish its diameter upon being inserted into the socket, and springing out again to the original shape when the pressure upon the sides is released.

It will be observed that the projection f^5, acting in connection with the aperture above it, nips or pinches the material, so that the fastening is held more firmly in place.

Having thus fully described my invention, I claim and desire to secure by letters patent of the United States—

1. The improved fastening for gloves and other articles, consisting of two members, one of which is provided with a socket, B, having the spring yielding sides *d* about the circular opening to the socket and adapted to be fastened to the material, and the other of which consists of a ball and tongue, also adapted to be fastened to the material, and the ball of which is adapted to enter the socket of the other member of the fastening device and be held therein, as described, all as set forth.

2. A member of a fastening device containing a socket, B, having an opening, C, and the yielding sides *d*, adapted to receive a suitable ball or other device, all substantially as and for the purposes described. 357–359

3. A member of a fastening device having the ball E, the straight tongue *e*, adapted to be used in connection with the other member of the fastening device described, and means for fastening the same to the material, substantially as specified, all struck up or formed from a sheet-metal blank, substantially as set forth.

4. As a means of fastening a member of a fastening device in place, a prong or projection, f^2, integral with the device and at or near the end of one arm thereof, and a hole, f^3, at or near the end of the other arm thereof, and a recess in the under surface of said arm adjacent thereto, the prong or projection being adapted to be passed through the hole and upset or clinched in the recess, all substantially as described.

5. In a member of a fastening device having two arms by which it is fastened to the material, the combination of the arm F, having the hole or aperture f^6, and the arm F′, having the projection f^5, all substantially as described, and for the purposes set forth.

WILLIAM S. RICHARDSON.

Witnesses:
F. F. RAYMOND, 2D.
W. C. FOGG.

361 UNITED STATES PATENT OFFICE.

WILLIAM S. RICHARDSON, of Boston, Massachusetts, assignor to the Ball and Socket Fastener Company, of Nashua, New Hampshire.

Glove-fastening.

Specification forming part of Letters Patent No. 300,508, dated June 17, 1884. Application filed April 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, William S. Richardson, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a certain new and useful improvement in fastenings for gloves and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature, in which—

(Here follows diagram marked p. 360.)

Figures 1 to 10, inclusive, show the various steps in the process of manufacture of my fastening, Figs. 11 to 16, inclusive, representing special features of construction, all of which will hereinafter be more fully described.

The invention is an improvement on that described in my letters patent numbered 260,050, and dated June 27, 1882, and 276,714, dated May 1, 1883; and it consists in a cup or socket, preferably made from one piece of metal.

Referring to the drawings, Fig. 1 represents the form of a blank which I prefer to use when I desire to employ a tubular extension or eyelet integral with the cup or socket as my fastening medium. In forming a tubular fastening or eyelet from a blank of this construction, I prefer to strike down the central portion thereof in any suitable way to the desired shape, and the blank, having been submitted to this forming manipulation, assumes the shape shown in vertical section in Fig. 2, and in plan in Fig. 3, in which *a* represents the tube or eyelet. The projecting portions or wings *a'* of the blank are the parts from which I form the socket or cup; and after striking down or otherwise forming the tube or eyelet *a*, I bend or draw—and I prefer the latter process—the sides *a'* to the shape shown in section in Fig. 4, and in plan in Fig. 5. The next step in the process is to bend the folded or drawn sides toward each other to the shape or substantially the shape shown in section in Fig. 6, and in plan in Fig. 7. This step completes the shaping process, so far as to give me the fastening tube or eyelet and the socket or cup having yielding sides; but while I may consider the process as finished at this stage, I prefer to advance it another step or stage, in order to obtain the flanges a^2, and this is done by breaking down the portions *a'* to the shape shown in section in Fig. 8, and in plan in

No. 259 B. & G. Fastener Co. } v. 360
Kratzer

(No Model.)

W. S. RICHARDSON.

GLOVE FASTENING.

No. 300,508. Patented June 17, 1884.

Fig. 1.

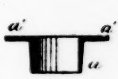


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12

Fig. 13.

Fig. 14.

Fig. 15.

Fig. 16.

WITNESSES
Bowdoin S. Parker.
Fred. Howard

INVENTOR
Wm. S. Richardson, by
his attys
Dodge & Raymond

Fig. 9. The complete fastening thus formed will have the eyelet or tubular fastening projection a, the yielding or spring sides a', which form the socket a^3, the recesses a^4, and shoulder a^5. By providing the fastening with the flange a^2, I am enabled to readily set the eyelet or tube and secure the fastening in place, as the flange affords an abutment for one jaw of a setting instrument; and I prefer that the spring or yielding sides be inside rather than outside the tube or eyelet, in order that the pressure exerted in setting it may be brought to bear upon the flange directly in line with it.

In Fig. 11 the yielding sides are turned into the eyelet or tube space and form a socket for the reception of the other member of the fastening within the tube or eyelet and below their under surfaces. The principle of the construction is, however, the same, the only difference being that the socket is made lower by bending the sides inwardly and downwardly, as shown.

In Fig. 13 the flanges a^2 are represented as bent down. This construction is of value, because it brings the fulcrum-point a^6, upon which the neck or arm of the other member of the fastening is brought to bear in the act of separating the two fastenings, nearer the ball than it is in the form shown in Fig. 8, as the inner edge of the flange then becomes the fulcrum-point instead of the outer edge. Of course, in lieu of the striking down or drawing from the blank represented in Fig. 1 an eyelet or fastening-tube, I may strike down or draw central fastening-prongs.

I have also found that by providing the ball member c of my fastening with a projection, c', which is adapted to bear upon the flange of the cup or socket member of the fastening when in place, not only will the two members draw in line with each other, but the ball is thereby held in place and prevented from passing to and into the cavity of the cup or socket. If the cup or socket portion has a tendency to cant or tip, the ball is more likely to leave the socket, as it then draws against the upper edge or weakest portion of the spring-holding sides.

362 & 363 When the cup or socket is formed as herein described, it will be an advantage to provide it with an extension or thumb-piece, d, provision for which may be made in the blank itself, which is illustrated in plan in Fig. 16. This thumb-piece is used with the shank of the ball for separating the ball from the socket by pressing them downwardly and toward each other, causing the shank to fulcrum on the flange and to lift the ball from the socket.

I may use a ball having a curved or bent shank, like that shown in Fig. 15, for the purpose of assisting the removal of the ball from the cup.

In lieu of attaching the ball at the side of the material by a shank or neck, I may fasten it by an eye or in any other way, much as a button is fastened in place on the material, and either on the outer or inner surface thereof, in which case the ball would have a vertical movement to and from the socket, and the neck or means of fastening to the material with which it is used preferably would pass

from its upper or, rather, under surface in line with the socket, and not from the sides.

In lieu of making the tubular extension or eyelet in one piece with the socket or cup, the same result is obtained if the edge of the socket or cup, which now makes the flange, incloses the flange of a separate tubular rivet or eyelet, and the two parts may be united either before the fastening is secured in place for use or during the act of so securing it. The thumb-piece d may be bent downward, if desired, to bring it out of line with the shank of the ball and permit the simple punching-pressure blow in disengaging the ball from the socket to always act to elevate the ball and socket and render the unfastening movement easy and natural.

Of course, it is not essential that the portion of the fastening which I call the "ball" be globular in shape, as it may be flattened or made oblong, cylindrical, or of any other desirable shape, as the sides and opening to form the cup portion can be changed to fit any of these shapes without departing from the spirit of the invention.

Having thus fully described my invention, I claim and desire to secure by letters patent of the United States—

1. A socket or cup-shaped member of a glove or other fastening, having spring sides, the flanges a^2, and an integral fastening or attaching device, all substantially as described.

2. A socket or cup member of a fastening device, having the yielding sides a', the recess a^6, the flange a^2, and the integral tubular eyelet or prong-fastening extension, all substantially as and for the purposes described.

3. A socket or cup member of a fastening device, having the thumb or finger piece d, all substantially as and for the purposes described.

4. The combination of the socket-member of a fastening device, having the yielding sides a' and the flange a^2, with the ball member of the fastening device, having the projection c', all substantially as and for the purposes described.

5. The ball member of the fastening, having the bent shank, all substantially as and for the purposes described.

WILLIAM S. RICHARDSON.

Witnesses:
PHILIP DUMARESQ.
FRED. HARRIS.

No. 289.
B. & S. Fastener Co.
v.
Kraetzer.
p. 364.

(No Model.)

W. S. RICHARDSON.

FASTENING FOR GLOVES, &c.

No. 300,509. Patented June 17, 1884.

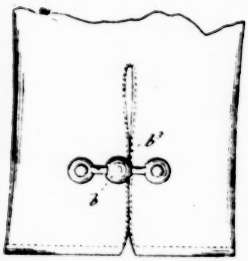


Fig. 1.

Fig. 2.

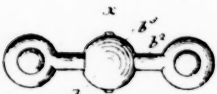


Fig. 3.

Fig. 4.

Fig. 8.

Fig. 5.

Fig. 6.

Fig. 7.

WITNESSES
Fred. Howson
Fred C. Howson

INVENTOR
Wm. S. Richardson
by his attys
Clarke & Raymond

365 UNITED STATES PATENT OFFICE.

WILLIAM S. RICHARDSON, of Boston, Massachusetts, assignor to the Ball and Socket Fastener Company, of Nashua, New Hampshire.

Fastening for Gloves, &c.

Specification forming part of Letters Patent No. 300,509, dated June 17, 1884. Application filed December 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, William S. Richardson, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful improvement in fastenings for gloves and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification in explaining its nature, in which—

(Here follows diagram marked p. 364.)

Figure 1 is a plan view of the wrist of a glove showing my invention in place. Fig. 2 is a vertical central section of the two members of the fastening riveted to material and engaged with each other. Fig. 3 is a plan view of the fastening. Fig. 4 is a cross-section on the line $x\ x$ of Fig. 3. Fig. 5 is a vertical section showing a modification. Fig. 6 is a plan view, and Fig. 7 a sectional view, of a variation in the manner of attaching the ball member. Fig. 8 is a plan view of the ball detached.

The invention is an improvement upon that described in my letters patent No. 276,714, dated May 1, 1883; and it consists, especially, in the arrangement of the ball-and-socket members of the fastening described in said patent, whereby the socket member of the fastening is made to cover the upper and side surfaces of the ball member, and is made available for ornamentation and the strength of its holding arm or shank increased.

In practicing this invention the ball member a may be spherical, as described in said patent, or it may have a flat under surface, a', as shown in Figs. 2, 4, 5, and 7; and on some accounts I prefer this construction, as the ball is thereby prevented from tipping, being supported on the article to which it is attached by its flat base. The socket member b has yielding sides b', and is like the socket member described in said patent, with the exception that the shank b^2 is curved in a direction opposite to that shown and described in said patent, and the upper portion, b^3, thereof provides means whereby an ornamental finish can be given the fastening. This shape of the shank increases its strength, especially at its junction with the socket. Suitable ornamentation can be given the upper surface, b^3, of the socket by stamping in dies or otherwise. In order that the socket may not turn too far laterally upon the ball member,

when a ball member having a flat under surface is used, I provide the same with stops or projections a^2, which extend outwardly from the under edge thereof; and the same result is obtained by forming a cavity in the top of the ball and striking down a corresponding portion of the socket member to enter the cavity and act as a stop in preventing this lateral movement of the socket in relation to the ball.

For the purpose of easily separating the two parts of the fastening by a downward pressure of the finger and thumb, I have provided the ball member with the projection a^3, which is adapted to bear on the edge of the socket when the two arms or shanks of the fastening are pressed downward, and it acts as a fulcrum, and, in connection with the shank of the ball member, forms a lever of the second order, whereby the ball is easily removed from the socket.

Of course the shape of the sides of the socket and the shape of the ball member may be changed to any other desired form without conflicting with the spirit of the invention; and it is obvious that the ball member may be fastened in place by other means than a shank extending backward from it; and I have shown in Figs. 6 and 7 the shank curved and forming a ring through which the separate pronged fastening c is passed.

Aside from the improvement in the construction of the socket member which provides for greater strength and the opportunity for ornamentation by its upper surface, another advantage from this application of form of the invention is gained in that the opening of the socket is covered or protected, so that dust, dirt, or lint cannot enter the socket while it is in use, and thus renders the fastening very available for use on boots and shoes and in other exposed places.

Probably the best form of flat seat a' is the annular or circular, shown in the figure, as a saving in metal is obtained; but of course the seat may be continuous and integral with the remainder of the ball, if desired.

In some instances when the fastening is used on flexible material, the ball member of the fastening will be tipped with
366 & 367 the socket member in disengaging them; but when the material is not flexible the socket member will be the one to be removed, as it is the one which is put on, and in this event the socket member will find its fulcrum on the projection a^3 of the ball, and thus becomes a lever of the first order. Of course the upper surface of the socket may not be continuous, and when so formed a saving in stock can be made, and at the same time an ornamental appearance given to it.

Having thus fully described my invention, I claim and desire to secure by letters patent of the United States—

1. In a fastening for gloves and other articles, the ball member thereof fastened to the article on which it is used, substantially as described, with a socket member also fastened to such article, and having, when so fastened, its mouth toward the surface of the article,

whereby it is adapted to be shut over the ball and cover or partly cover it, as specified, substantially as and for the purposes set forth.

2. A ball member of a fastening device having the flat under surface, a', adapted to rest upon the surface of the material to which the ball is attached and steady the same thereon, all substantially as and for the purposes described.

3. In a fastening for gloves and other articles, a ball member having the stops or projections a^2, in combination with a socket member, all substantially as and for the purposes described.

4. In a fastening for gloves and other articles, the combination of the ball member having the fulcrum projection a^3 and a socket member adapted to shut upon and inclose the ball member of the fastening, all substantially as and for the purposes described.

5. In a fastening device for gloves and other articles, the socket member having the upper surface adapted to be ornamented, and downwardly-extending yielding sides adapted to inclose the other member of the fastening device upon its edge and upper surface, all substantially as and for the purposes described.

6. A socket member of a fastening device having the yielding sides b', the arm or shank b^2, curved in cross-section, as described, all substantially as and for the purposes set forth.

WILLIAM S. RICHARDSON.

Witnesses:
F. F. RAYMOND, 2D.
FRED. B. DOLAN.

369 UNITED STATES PATENT OFFICE.

WILLIAM S. RICHARDSON, of Boston, Massachusetts, assignor to the Ball and Socket Fastener Company of Nashua, N. H.

Glove-fastener.

Specification forming part of Letters Patent No. 300,510, dated June 17, 1884. Application filed January 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, William S. Richardson, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a certain new and useful improvement in the manufacture of fastenings for gloves and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings forming a part of this specification in explaining its nature, in which—

(Here follows diagram marked p. 368.)

Figure 1 is a plan view of a wrist portion of a glove having my fastening. Fig. 2 is a vertical central section (enlarged) of the fastening when secured in place. Fig. 3 is a view in section of the socket-fastening. Fig. 4 is a plan of the blank from which it is made. Fig. 5 represents in section the parts of the ball-fastening device before they are secured together. Fig. 6 shows the same view of the two parts of the socket. Figs. 7, 8, and 9 show views of the various forms of the ball member in side elevation.

This invention is an improvement upon that described in my letters patent No. 260,050, dated June 27, 1882; and it relates to a socket member having a flange folded over to form a recess or space for the reception of a fastening-eyelet, to a ball member having a like construction for fastening in place, and to a ball having its shank projecting tangentially instead of radially.

I prefer to form the socket member from a blank shaped substantially as shown in Fig. 4, by striking down the central portions, a a', thereof to form the yielding sides a^2 of the socket and the connecting-sections a^3, and the outer portion, a^4, of the blank is folded down and turned in to form a flange, a^5, below the seat or disk portion a^6, within which flange the end section, b, of an eyelet, b', is turned and held. The outer surface, a^7, of the parts forming the yielding sides and the connecting-sections a^3 should be so inclined as to provide means whereby the end of the fastening-eyelet is turned outward, so that it shall be caused to be extended outwardly at substantially right angles to the remainder of the eyelet-tube, and well into the space or cavity within the flange a^5. The eyelet preferably has a flat flange, b^2, and when the two fastenings come

No. 289. U.S. Fastener Co. } p. 368.
Kratzer

(No Model.)

W. S. RICHARDSON.

GLOVE FASTENER.

No. 300,510. Patented June 17, 1884.

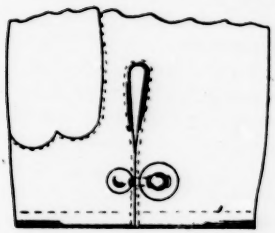


Fig. 1.

Fig. 2.

Fig. 3.

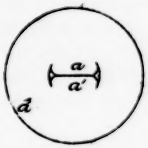


Fig. 4.

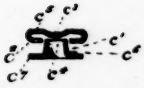


Fig. 5.

Fig. 6.

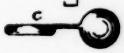


Fig. 7.

Fig. 8.

Fig. 9.

WITNESSES

Fred. Haynes

Dick & Hopkins

INVENTOR.

William S. Richardson

by his Atty

Charles W. Raymond

together a smooth and finished surface is given the fastening upon the inside of the article to which it is attached, as well as upon the outside, and they will occupy the position in relation to each other shown in Fig. 3. This member of the fastening can be used in two ways—that is, the socket portion may form the under section of the fastening and the yielding sides project therefrom into or through the hole previously formed in the material to which it is attached, in which case the eyelet would be inserted from above, and from the upper surface of the complete member; or the parts may be reversed, so that the yielding sides of the socket, instead of extending upwardly through the hole, shall extend from the upper surface of the material downward into or through the hole, in which case of course the eyelet member will be on the under surface of the material, and the socket member becomes the part which is moved in the act of fastening and unfastening the glove, rather than the ball member, and this last-named construction gives an open socket, and in this respect the socket member differs from the member described in my various letters patent.

The ball member of the fastening, instead of being fastened by a tubular rivet or eyelet, as described in my said patent, is formed from a blank in substantially the same way that I form the ball therein described, with this exception, that the annular portion c, in which the hole is formed for the reception of the fastening rivet or eyelet c', is made somewhat larger, and the outer portion thereof folded in upon itself in the same manner as in the socket member to the shape shown at c^2 in Fig. 5, to provide a holding-flange for the end of the fastening-eyelet, and the central section, c^3, is formed or struck down to provide a conical projection, c^4, so that the end of the fastening-eyelet upon striking the side of the same shall be turned or folded therein to enter the space c^5 above the flange. The eyelet c^6, used therewith, is preferably a flat flange, c^7, and in Fig. 2 I represent the fastening as attached to the article with which it is used.

370&371 The advantages of the form and construction described for the socket member are economy of metal and cheapness of construction, combined with a very strong substantial manner of fastening, and a very neat and ornamental finish of the same upon both the upper and lower surfaces, and the special advantage of the method of attaching the ball member of the fastening is, that it is very securely held in place thereon, and the material to which it is attached is not likely to be injured or cut along the edge of the ring or seat of the fastening by its use.

The ball, instead of being supported by a radial arm or shank, as shown in Fig. 7, may have the arm or shank extend tangentially from the same, as shown in Figs. 8 and 9, or from any portion of the circumference of the ball between the extreme tangent shown to the radial, and this form of ball is new; or the shank of the ball may be bent to throw the ball up or down in relation to the end of the shank or seat. There are formed between the yielding sides a^2 the recesses d, which provide a space for the arm of the ball, and also allow the sides to yield.

It will be observed that by the construction described the socket member is firmly clamped to the material and the end of the fastening device concealed from view.

Having thus fully described my invention, I claim and desire to secure by letters patent of the United States—

1. A member of a fastening for gloves and other articles, consisting of a section having the flange a^5, yielding sides a^2, and an eyelet b', having a flange, b^2, and end section, b, turned within the recess formed by the flange a^5, all substantially as and for the purposes described.

2. A member of a fastening device for gloves and other articles, having the yielding sides a^2, shaped substantially as specified, and the flange a^5, bent or drawn to form the recess a^8, for receiving and holding the end of a device for securing the member in place, all substantially as and for the purposes described.

3. The ball member of a fastening device, having the seat provided with the flange c^2 and the recess c^5, all substantially as and for the purposes described.

4. The ball member of a fastening device, its seat and flange c^2, forming the recess c^5, and conical projection c^4, all substantially as and for the purposes described.

5. The combination of a ball member of a fastening device, having the flange c^2, forming the recess c^5, with the eyelet c', having the flange c^7, all substantially as and for the purposes described.

6. A member of a fastening device for gloves and other fastenings, having the yielding sides a^2, the seat a^6, the turning surface a^7, and the flange a^5, bent or drawn to form the space or recess a^8, within which the end of the device for securing the member in place is turned to lap upon the upper surface of the flange a^5, all substantially as and for the purposes set forth.

7. A ball-fastening having an arm integral therewith, but extending therefrom tangentially or out of a radial direction, all as described.

WILLIAM S. RICHARDSON.

Witnesses:
F. F. RAYMOND, 2D.
FRED. B. DOLAN.

B. & G. Fastener Co. } p. 372
Krautzer

(No Model.)

A. G. MEAD.

BUTTON.

No. 325,688. Patented Sept. 8, 1885.

Fig. 2.

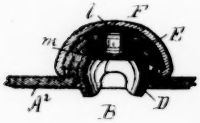


Fig. 1.

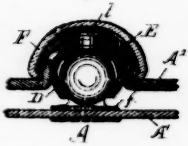


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

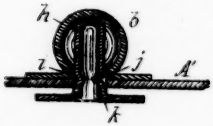
Fig. 7.

Fig. 8.

Fig. 10

Fig. 9.

Fig. 11.



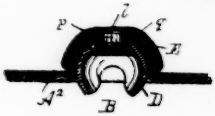


Fig. 12.

Witnesses.
H. C. Ledger
A. F. Hayden.

Inventor.
Albert G. Mead.
F. Curtis, Atty.

373 UNITED STATES PATENT OFFICE.

ALBERT GALLATIN MEAD, of Boston, Massachusetts, assignor to the Ball and Socket Fastener Company, of Nashua, N. H.

Button.

Specification forming part of Letters Patent No. 325,688, dated September 8, 1885. Application filed February 2, 1885. (No model.)

To all whom it may concern:

Be it known that I, Albert Gallatin Mead, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in buttons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to metallic fastenings employed in securing the separate flaps of any article, such as gloves or other similar articles of wear, in lieu of the ordinary button and button-hole, and pertains especially to that class entitled "ball-and-socket fastenings," in which a ball is adapted to be inclosed by and retained within the hollow or socket member, when the fastening is actively employed.

I consider my present invention embraces, first, the method of centrally securing the socket portion of the fastening to the article, whereby the open part or socket of said member is disposed upon the under side of the flap and secured by a rivet extending through the fabric, thus in permanently securing it to the latter a suitable button-head or cap is employed upon the upper surface of the flap and can be so formed and constructed as to form a button finish, a result much desired, since it gives the article an appearance exactly similar to an ordinary button, which is the most neat and tasty finish that can be employed in the class of articles of apparel to which such fastenings are usually attached, but, further, the whole device is thereby concealed and prevented from becoming caught and broken; secondly, in the peculiar method of forming the ball member of said fastening, as likewise that of the rivet by which the ball is secured to the fabric, the two parts forming a unit and readily used in connection with the socket member, forming an article very easily manufactured, cheap, and inexpensive, and one which presents an unusually ornamental finish.

(Here follows diagram marked p. 372.)

The drawings represent, in figure 1, a cross-section of a complete fastening attached to the material, composed of the two members constructed as herein specified and embodying my invention. Fig. 2 is a vertical section of the socket member completed and attached to the fabric, while Fig. 3 shows a similar section of the ball member of the fastening. Fig. 4 shows the button-shaped cap with the fastening eyelet or rivet without the socket portion. Figs. 5 and 6 are cross-sections taken diametrically through the socket portion. Fig. 7 is a plan of the complete socket member. Fig. 8 shows a partially-completed ball struck from an intact blank. Fig. 9 represents the completed ball prior to the attachment to the material, and Fig. 10 the rivet employed in fastening to the fabric the ball, which is adapted to be employed in connection with the socket. Fig. 11 illustrates the rivet in position in the hollow ball before compression. Fig. 12 represents the other member of the fastening and its attaching devices.

In these drawings I have represented the complete fastening at A as composed of two portions; B, the socket or hollow inclosing part, while C represents the ball or inclosed portion, which I will now proceed to describe, and may be considered as compound, since it is incomplete without its fastening-rivet *a*, which secures the active or ball element *b* thereof to the fabric. This portion *b* is formed from a flat blank, *c*, formed of any suitable metal by a die which at the same time operates to strike up and form a short cylinder, *d*, hemispherical at its extremity, say, from the broken line 1 2, while the diameter of said cylinder is to be the same as that of the finished ball portion *b*. After this operation the blank is transferred to a second die or revolving rollers, where the short cylinder or neck portion *d*, below the line 1 2, is compressed and rounded into a hemispherical shape, *e*, which completes the ball *b*. (See Fig. 9.) Moreover, the metal forming the lower portion during this forming process has drawn down the top portion and shortened it slightly, and the whole sphere, when completed, rests snugly upon the flange *f* and is now in readiness to be secured to the fabric as one member of a fastening device of the class hereinbefore premised.

374 Hitherto it has been a very difficult thing to secure a member of a fastening device so constructed to the fabric, since if any device is attached to its exterior periphery in order to secure it the usefulness of the ball is very much impaired, since a portion of the surface is occupied. Hence I have employed in lieu of an external fastening, which has heretofore been generally employed, an internal or central fastening, and in the method employed I consider exists one of the essential features of my invention.

I will now proceed to describe the second element, *a*, or fastening-rivet of the ball portion or inclosed part of the fastening. This rivet is formed somewhat similar to the other element, *b*, from a circular blank, *g*; but the latter is struck up in the form of a cylinder, hemispherical, preferably, at its extremity and of an external diameter, equal to the opening *i* in the ball or inclosed part. Afterward said blank is transferred to a pair of rolls, which cripple or weaken the metal at the contracted portion *j*, leaving the upper

portion intact and of a length, as shown by the dotted lines 5 6, slightly longer than the diameter of the ball *b*, for purposes to be described. This passing of the rolls over the part *j* leaves a short neck, *k*, below, and is of a suitable length adapted to compensate for the thickness of the fabric A′. From this neck extends the flange which forms a bearing for the fastening, to give it steadiness, and at the same time more securely affix it to the material, since it incloses a larger area of the latter and prevents it tearing away.

In order to secure the ball element *b* of the member C of the fastening to the material, I proceed as follows: Having punched or otherwise formed a hole in the fabric, I place the ball element over said hole with the opening *i* in alignment therewith. I then take the rivet *a* for fastening the part *b* of said member C and insert it through the hole in the fabric and into the ball *b* until the cylinder *h* rests against the top of the ball, (see Fig. 11,) when, owing to the length of said rivet, the flange does not come in contact with the material A′, and it requires to be inserted in a die in which the matrix is spherical to prevent injury to the ball in the act of securing the two elements together. Then the plunger is brought down upon the flange of the fastening rivet *a*, while, owing to the crippling of the metal at *j*, before mentioned, which part is constructed to rest about opposite the top of the opening *i*, the metal begins to yield and spread or flatten against the pressure, rolling outward, while the top of the cylinder *h* is spread out and very nearly fills the interior of the ball, approximating thereto in general shape as shown in Fig. 3. This compression or crippling of the fastening-rivet *a* has somewhat reduced its length, and its flange now firmly closes the material between it and the flange *f* of the button part *b*. This crippling of the material effects a second result besides that accomplished in the above description—that is, it prevents any undue pressure from distorting the proper shape of the neck *k*, and this always insures a proper fastening of the member C without disturbing the normal shape of said neck.

I have now in complete and perfect form a member, C, of a fastening device, spherical in shape, intact throughout its periphery, and yet securely and rigidly fastened to the fabric without any exterior fastening appendages by which to attach it, as is usual, and impair its efficacy or detract from its appearance.

In a fastening device of the class before premised, a somewhat similar difficulty has existed in securing the socket or hollow inclosing portion of the fastening, as has occurred in attaching the ball or inclosed portion thereof, and I have therefore constructed such socket member as follows: D represents, in Figs. 5 and 6, diametrical cross-sections of a hollow socket provided with yielding sides. This form of socket has heretofore been secured to the upper side of the fabric by a lateral arm, which does not present a neat or ornamental finish, and is liable to catch and be torn from the article. Hence I propose to radically change the position thereof and employ the active or socket portion below the fabric, and dispose an ordinary fastening eyelet, *l*, through said socket D. This eyelet is

located centrally of the socket, and when this part of the fastening is completed is secured and rests at its top between the cap or button-head F, which surrounds the whole and the disk E, while its lower extremity is similarly upset upon and over the interior periphery of the socket D. The disk E may be a flat plate; but in the present instance I have shown its outer edge or circumference bent in order to approximate to the general shape of the button-head when the latter is pressed into its finished form, and thus it strengthens said cap. Moreover, the eyelet *l* is passed into this disk E and secured between the latter and the button-cap by pressing the two together, as shown in Fig. 2. Hence in securing this socket or any similar hollow member of a fastening device, I punch a hole in the material sufficient to enter the eyelet *l*. Having previously struck up the button-shaped cap F, I place in it the centrally-perforated disk E, with the eyelet in it, and insert the lower extremity of the latter into the opening *m* of the socket D, which has likewise been placed in position upon the under side of the material and centrally of the hole therein, in readiness for the introduction of said eyelet. When this is accomplished, the button-shape cap is placed in a similarly-shaped die, and with a round-headed plunger the lower extremity of the eyelet *l* is swaged or pressed out laterally. By this process the disk E approximates very nearly in shape to the outside periphery of the button-head, while between these two elements is retained the enlarged top of the eyelet *l*. Moreover, the lower extremity of said eyelet is spread out at the same
375–377 operation against the interior surface of the socket D, and the latter is maintained in close connection with the fabric A^2 and the parts D E F and *l* are firmly united, thus completing the other member or inclosing portion of the fastening fabric.

By reference to Fig. 12 of the drawings, I have shown a slight deviation in the manner of finishing the button portion of the fastening, as shown in Fig. 2; but I do not consider this modification distinct from the spirit of my invention, nor embodying new matter, since it would ordinarily suggest itself to one skilled in the art to which it appertains. In case it is desired, the imperforate cap or button-head F may be entirely removed, and by this means, although not securing a button finish, still the cost of making this part of the fastening is materially lessened. Supposing this form is adopted, the eyelet must be flush with the exterior surface of the disk E. In order to present a more perfect finish, and at the same time to prevent the edges thereof from catching, I have formed an annular depression, *q*, in the top of said disk E of a depth equal to the thickness of the metal forming the eyelet *l*. Thus a smooth exterior surface is secured. In lieu of finishing the socket portion of the fastening in the manner above described, a capped eyelet may be employed, in which the cap of the eyelet may be extended to cover and inclose the disk E in the manner shown in Fig. 2 as accomplished by the imperforate cap or button-head F, since by this method the cost of the finished article is somewhat lessened.

It will readily be seen that the interior or active portion of said socket or inclosing portion is not interfered with, and the ball mem-

ber can easily enter its full diameter, if so desired. On the other hand, I have effectually concealed the socket portion of the fastener from sight, and in lieu thereof I have substituted a simple circular button cap or head, as shown in Fig. 7.

The whole fastening device, when the component parts (the ball and socket) are interlocked or actively employed, presents a very neat and tasty appearance, since from disposing the said members in the manner above described all parts are concealed except the cap F, which surmounts the whole, and, if it is so desired, may be engraved or otherwise more or less ornamentally finished.

I claim—

1. A flanged ball or sphere formed from a sheet of metal intact, and provided with an interior chamber, with a fastening-rivet adapted to be inserted and flattened within said ball, for the purpose set forth.

2. A flanged tubular fastening-rivet constructed in one piece and provided with a head and neck, in combination with a flanged hollow ball which receives said head, and is held to the material by said rivet, for the purpose set forth.

3. In a fastening device, the flanged rivet composed of the head, the contracted or crippled part *j*, and the neck, whereby, upon compression, the head is spread laterally, and the ball member of the fastening is secured to the fabric, all substantially as and for the purposes herein set forth.

4. In a fastening device of the nature described, the inclosing portion composed of a hollow socket centrally secured to the fabric by a button-head, F, and with the inclosing portion disposed upon the under side of the flap, substantially as stated.

5. The combination, with a member of fastening device composed of a hollow socket, with spring or yielding lips disposed upon the under side of the flap and centrally secured to the latter by a button-head, of the ball constructed and secured to the outside of the material, in the manner substantially as set forth.

6. A member of a fastening device consisting of a hollow socket, in combination with a rivet and button-head, whereby it is centrally attached to the fabric, substantially as set forth.

7. A member of a fastening device composed of a hollow socket, D, centrally attached by an eyelet, *l*, the latter resting upon and within an annular depression, *q*, formed in a concaved collet or disk, E, substantially for purposes herein set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT GALLATIN MEAD.

Witnesses:
H. E. LODGE.
A. F. HAYDEN.

379 UNITED STATES PATENT OFFICE.

WILLIAM S. RICHARDSON, of Boston, Massachusetts.

Glove-fastening.

Specification forming part of Letters Patent No. 325,699, dated September 8, 1885. Application filed February 9, 1885. (No model.)

To all whom it may concern:

Be it known that I, William S. Richardson, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a new and useful improvement in fastenings for gloves and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The subject-matter of this invention was originally described in my application for letters patent of the United States filed December 19, 1884, serial No. 150,714, but is withdrawn therefrom for the purpose of embodying the same in a separate application. It relates especially to the portion of my improved fastening known as the "flanged socket," or a flange or disk of metal having the portions which form the yielding sides of the socket struck down therefrom, and preferably from the central or interior part of the disk. I have represented in the drawings this socket ring-piece as being secured to a cap and fastening-eyelet, and in the application referred to I have described other but equivalent devices for securing it in place.

Referring to the drawings—

(Here follows diagram marked p. 378.)

Figure 1 represents in plan view a blank from which the cap is made. Fig. 2 shows in vertical section the blank after it has been submitted to a forming operation, whereby a rounded upper surface and a short tubular section are formed. Fig. 3 shows in plan the disk from which the flanged socket is made. Fig. 4 represents in perspective the flanged socket-piece. Fig. 5 shows the same in vertical section. Fig. 6 is a vertical section of a flanged tubular fastening. Fig. 7 represents the cap, flanged socket-piece, and tubular fastening assembled. Fig. 8 shows in vertical section the parts secured together by the drawing in of the short tube of the cap upon the under surface of the flange of the tubular fastening. Fig. 9 shows in sections the complete fastening, also the washer which is employed upon the under surface of the material to which the fastening is secured. Fig. 10 represents the fastening as secured to the material, the lower portion of the tubular fastening having been bent outward upon the washer. Figs. 11, 12, and 13 show the ball member of the fastening device, which is fully described in my said application. Fig. 14 shows the relation which the ball fastening bears to the socket.

A is the cap blank. It is drawn in suitable dies to the shape shown in vertical section in Fig. 2, and then has the rounded cap *a* and the short tube *a'*. B is the flanged socket-disk. The portions forming the yielding sides are drawn down from the central portion thereof, and the end of the drawn-down part removed, as well as

(No Model.)

W. S. RICHARDSON.

GLOVE FASTENING.

No. 325,699. Patented Sept. 8, 1885.

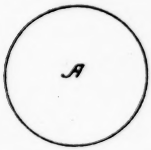


Fig. 1.

Fig. 2.

Fig. 3.

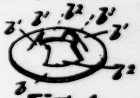


Fig. 4.

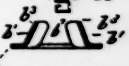


Fig. 5.

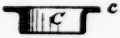


Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

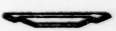


Fig. 13.

Fig. 14.

No. 289.
B. & S. Fastener Co. } p. 378.
v.
Kraetzer.

WITNESSES.

P. H. Dunning

INVENTOR.

W. S. Richardson

portions of the sides of the drawn-down section, to provide the yielding jaws; or a slit and holes are first formed in the blank, as shown in Fig. 3, and the yielding jaws then struck down; or any other process of forming the piece may be employed, and when complete the flanged socket-piece has the flange *b* and the yielding sides *b'*, which are separated from each other by the openings b^2. When formed as shown in Fig. 4, it is preferably made of spring-brass, or of metal harder and more springy than the cap-piece of the eyelet, in order that it may better stand constant wear, to which it is subjected, as it forms the principal wearing-surface of the fastening. It is of course adapted to be secured to the material in any desired way. I have represented only one manner of fastening it in place as an illustration of its use. This comprises the employment of a tubular fastening, C, having the flange *c*, and the flanged socket-piece is secured thereto by the cap, a portion of the tube *a'* of which is drawn in upon the under surface of the flange *c*, as represented in Fig. 8.

In securing the fastening to the material a hole is formed and the fastening tube passed through it, and its edge bent or turned upon the washer placed upon the under surface thereof. (See Fig. 10.)

D is the ball or other member of the fastening, and it has a neck, *d*, and an enlargement above it, and when the two parts of the fastening are together the bearing-edges b^3 of the socket embraces the neck of the fastening, or the portion immediately above the same, but not at the full diameter of the ball. It will be observed that this flanged socket-piece has three especial features: first, it has the yielding extensions which form the sides of the socket and are jaws which close upon the neck of the ball, which preferably are curved in horizontal section, and are also slightly curved in vertical section, so that a quite strong construction can be obtained with very thin metal; second, the ends of the yielding sides form a portion of a circular opening, and also a somewhat long wearing contacting-surface, and they are separated from each other by a space sufficient to permit of their yielding or moving in relation to each other; third, these yielding sides or sockets project from a flange by which they are held or located in place, the flange being the holding device by which they are supported and adapted to be secured in position. It will be observed, also, that by making the yielding sides or jaws from the interior section of the disk there is very little waste.

380 & 381

The operation of the fastening is fully described in my said application.

Having thus fully described my invention, I claim and desire to secure by letters patent of the United States—

In a fastening for gloves and other articles, the jaw or socket piece having the yielding sides *b'* and flange *b*, from which the sides project, and by which they are held, all substantially as and for the purposes described.

WM. S. RICHARDSON.

Witnesses:

P. K. DUMARESE.

F. F. RAYMOND, 2D.

383 UNITED STATES PATENT OFFICE.

WILLIAM F. RICHARDSON, of Boston, Massachusetts.

Glove-fastening.

Specification forming part of Letters Patent No. 325,698, dated September 8, 1885; application filed December 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, William S. Richardson, of Boston, in the county of Suffolk and State of Massachusetts, a citizen of the United States, have invented a new and useful improvement in fastenings for gloves and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention is an improvement upon that described in my patents numbered 260,050 and 300,509, dated, respectively, June 27, 1882, and June 17, 1884; and it consists in various details of construction which cheapen its cost and permit it to be easily applied.

Referring to the drawings—

(Here follows diagram marked p. 382.)

Figure 1 is a plan of a blank from which the cap of the fastening is formed. Fig. 2 represents the shape of the blank after having been submitted to the action of suitable dies, whereby the curved top and short sleeve are formed. Fig. 3 represents the plan of a blank for an intermediate piece of the fastening. Fig. 4 shows this blank as shaped by the dies. Fig. 5 is an elevation of a pointed flanged rivet. Fig. 6 shows the rivet attached to the piece shown in Fig. 4. Fig. 7 represents the cap and intermediate piece assembled. Fig. 8 represents a section of the complete capped fastening-prong. Fig. 9 is a section of the socket adapted to be fastened by the prong to the cap. Fig. 10 shows in section the position which the socket bears to the cap when fastened to a glove-flap or other material. Fig. 11 is a section at right angle to that of Fig. 10. Fig. 12 shows a section of a stud adapted to be used with the socket member of the fastening, as represented in section in Fig. 13. Fig. 14 shows the fastening prong or projection formed on the under side of the cap. Fig. 15 shows the prong formed upon the under surface of the intermediate piece and cap. Fig. 16 illustrates a detail which is hereinafter described. Fig. 17 shows a manner of forming a prong integral with the intermediate piece by striking down a V-shaped or pointed section to the position shown in Fig. 18.

The fastening comprises, in substance, three elements or their equivalents—first, the part which I call the "cap;" second, the interior diaphragm or piece for supporting the pointed fastening projection which preferably is made separate; and, third, the socket,

B. & S. Fastener Co. No. 389 } p. 382
Kraitzer

(No Model.)

W. S. RICHARDSON.

GLOVE FASTENING.

No. 325,698. Patented Sept. 8, 1885.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11

Fig. 12.

Fig. 13.

Fig. 14.

Fig. 15.

Fig. 16.

Fig. 17.

Fig. 18.

WITNESSES.
J. M. Dolan
Fred. S. Dolan

INVENTOR.
William S. Richardson
by his atty
Crosby & Gregory

which is fastened to the intermediate piece by the pointed projection, which extends through the material and through the hole in the upper surface of the socket, and is clinched or turned therein.

The invention is especially applicable to that class of fastenings in which the socket is used with its opening downward or toward the material to which it is attached, or to which the other member is secured. The cap A is made from a disk, *a*, of proper shape, which is drawn to the form shown in Fig. 2—that is, to have the rounded top *a* and the short sleeve *a'*. The second or intermediate piece, B, of the fastening is shaped from the disk *b*, and preferably is formed in suitable dies to the shape shown in Fig. 4. It either has a hole centrally formed for receiving the flanged pointed rivet C or has a fastening-prong formed integral therewith, as represented in Fig. 17. I prefer the former of the two ways, and the shape of the rivet which I prefer is represented in Fig. 5. This rivet is made of soft metal, has the head *c* and the point *c'*, and when in position in the intermediate piece, B, its shank extends through the hole *b'* and its head rests upon the upper surface thereof, as represented in Fig. 6. This intermediate piece, with the fastening projection, is then secured to the cap by drawing or folding the sleeve upon the under surface of the piece, as represented in Fig. 7, and thus forms what is, in substance, a fastening stud or point having a cover, flange, or cap.

The socket portion D of the fastening is like that shown in my patent No. 276,714, with the exception that it has no arm by which it is secured in place—that is, it simply consists of a piece of metal struck to the shape shown in Fig. 9, whereby it is provided with yielding sides or jaws.

A hole, *d*, is formed in the central part of the device, through which the fastening-prong C is passed in attaching it to the material. To apply it to a glove-flap or other article, the prong of the cap-section is passed through the material and into the hole in the socket, which is placed upon the under side thereof, and it is then headed, clinched, or turned down upon its inner surface, thereby firmly securing the cap and the socket together and to the flap or material, the material, it will be observed, being between the socket or cap. With this form of construction it will be noticed that it is unnecessary to first form a hole in the flap or material before the socket is secured in place. The cap may be covered with cloth or other suitable material, as described in my pending application executed December 15, 1884, or any form of stud or ball may be used in connection with the fastening. Of course the cap can be attached directly to the head of the fastening rivet, instead of to the intermediate piece, through which it passes, if desired, in which event the intermediate piece may or may not be used, as may be preferred. The fastening prong or projection is integral with the cap, and extends from the under surface thereof, as shown in Fig. 14, or from the intermediate piece, as shown in Fig. 15; and in lieu of bending the sleeve of the cap under the lower edge of the intermediate piece, as shown in Fig. 8, it may be bent downward and inward to form a side, *e*, to the cap, as shown

in Fig. 16, in which case the lower edge of the intermediate piece, B, will bear against the inner surface of the side, and the lower edge of the side *e* will bear upon the surface of the material. In other words, the edge of the cap, instead of being folded around and under the intermediate piece, B, as shown in Fig. 13, is turned downward and inward to form a tapering-sleeve, the lower edge of which rests upon the material.

To obtain the best results, it is desirable that the cap should be quite deep, in order that the socket member of the fastening when applied to a glove-flap or other material may set well up within the cap, so that its mouth or lower surface shall not project much, if any, below the under surface of the material to which it is attached; but of course I do not confine my invention to this special form of cap, as a shallower one may be used.

Having thus fully described my invention, I claim and desire to secure by letters patent of the United States—

1. The fastening device comprising a capped prong or pointed rivet, C, and the socket D, secured to the cap by the prong or pointed rivet, as described, all substantially as and for the purposes set forth.

2. The combination of the cap A, the intermediate piece, B, the pointed fastening C, and the socket member D, through the top of which the pointed fastening is passed, and upon the under surface of which it is headed or clinched, all substantially as and for the purposes described.

3. The cap A, having the side section or tapering sleeve, *e*, in combination with the socket-piece D, all substantially as and for the purposes described.

WILLIAM S. RICHARDSON.

Witnesses:
F. F. RAYMOND, 2D.
FRED. B. DOLAN.

A. A. Abbot,

Shoe Fastening,

No. 79,800. Patented July 14, 1868.

Fig. 1.

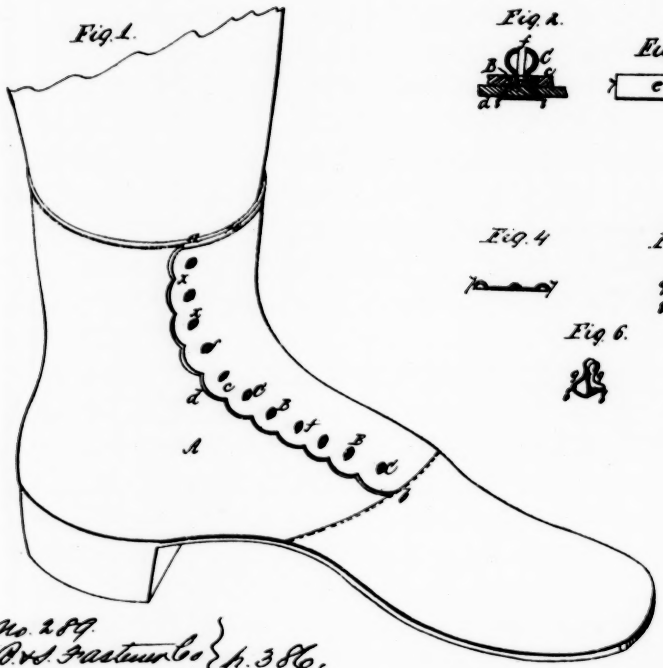


Fig. 2.

Fig. 3.

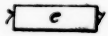


Fig. 4

Fig. 5.

Fig. 6.

No. 289.
B. & S. Gastman & Co
Kratzer
} p. 386.

Witnesses.
W. Cranbury
F. C. Hoagland

Inventor
Andrew A. Abbot
Per his Attorneys
Taschemacher & Hearne

387-389 UNITED STATES PATENT OFFICE.

ANDREW A. ABBOT, of Boston, Massachusetts.

Letters Patent No. 79800, dated July 14, 1868.

Improvement in Fastenings for Boots.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern :

Be it known that I, Andrew A. Abbot, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain improvements in fastenings for boots, shoes, gloves, garments, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making part of this specification, in which—

(Here follows diagram marked p. 386.)

Figure 1 is a perspective view of a boot, with my improved fastening applied thereto.

Figure 2 is a longitudinal section on the line *x x* of Fig. 1, (enlarged.)

Figures 3, 4, 5, and 6, details to be referred to.

The ordinary fastenings employed for securing a boot or shoe to the foot, and various garments to the body are objectionable because of the inconvenience and delay in fastening or catching them in place when the shoe or garment is to be worn, and in liberating or disengaging them when the same are to be removed.

My invention has for its object to obviate the above-mentioned difficulties, and consists in one or more spring-buttons or fastenings, attached to one side of the shoe or other article, and entering the hole or eyelet in its other side, the two sides being caught or secured together by simply pressing the eyelet down over the spring-button, the two ends of which are thus compressed or closed together, to allow of their entering the eyelet, after which, on the removal of the pressure, they spring back and spread apart, so as to project outside of the edge of the hole in the eyelet, thus securely holding the sides or flaps of the article together, a slight outward pull only being required to disengage the fastening.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is a half or Balmoral boot, which is made to open from *a* to a point, *b*, above the ankle. Near one edge, *c*, of this opening, is secured a row of eyelets, B, while near its other edge, *d*, is secured a series of spring-buttons or fastenings, C, the construction of which is as follows :

A strip of suitable spring-metal is cut into pieces, *e*, of the form shown in Fig. 3, when its ends, 7, are placed in a die, by which they receive a cup-shape, as seen in Fig. 4, after which the piece of metal is bent around at right angles, as indicated in Fig. 5. Through the edge, *d*, of one of the flaps of the "upper" are made a series of slits or perforations, through which are passed the pieces *e* when in the shape shown in Fig. 5. The outer or cup-formed ends are now brought nearer together by bending or inclining the portions from 8 to 9, by a pair of pincers, or otherwise, and a spring-split button is thus made, which readily enters the eyelet when pressed down thereon, and springs back after its entrance, becoming so enlarged, in a direction at right angles to the opening *f*, as to exceed the diameter of the eyelet, and thereby connecting the two flaps together, the diameter of the spring-button in the direction of the length of the opening *f* being a trifle less than that of the eyelet, in order to enter therein and be removed therefrom freely.

The shoe may be conveniently and expeditiously unfastened by simply taking hold of the upper edge, 10, of the flap, *d*, and drawing gently outward and downward.

The above-described devices may be used to advantage as fastenings for gloves, corsets, dresses, coats, and various other garments, flaps, or curtains of carriages, and articles of jewelry. They may also serve as clasps for bags, and may be applied to many other uses too numerous to mention.

I do not limit myself to the exact construction above described, as it may be varied somewhat without departing from the spirit of my invention; for instance, the spring-button may be formed by splitting or making a slit in a solid piece of metal, the upper end of which is enlarged, and of the form of the button required, and its lower end may be passed through the outside of the "upper," and riveted to the leather before the lining is stitched thereto.

Claim.

What I claim as my invention, and desire to secure by letters patent, is—

The within-described fastening, consisting of the spring-button C, in combination with an eyelet, B, or its equivalent, substantially as described.

A. A. ABBOT.

Witnesses:
N. W. STEARNS.
JOSIAH W. HUBBARD.

H. T. Lee,

Shoe Fastener.

No. 108491. Patented Oct. 18. 1870.

Fig. 1.

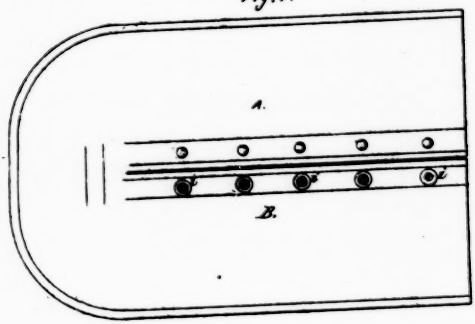


Fig. 2.

Fig. 3.

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Kratzer.
} p. 390.

Witnesses
Jno. L. Byrne
Geo. H. Strong.

Inventor.
Henry T. Lee.

391–393 UNITED STATES PATENT OFFICE.

HARVEY T. LEE, of Marysville, California.

Improvement in Shoe-fastenings.

Specification forming part of Letters Patent No. 108,491, dated October 18, 1870.

To all whom it may concern:

Be it known that I, Harvey T. Lee, of Marysville, county of Yuba, State of California, have invented an improved shoe-fastening; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to an improved device for securing the two side portions of a shoe together when it is upon the feet of the wearer, in place of the lacing or buttons usually employed.

My invention is designed to save time in fastening the shoe, and also to provide a device which will not become unfastened itself by the movements of the foot in walking.

In order to explain my invention so that others can understand its construction and operation, reference is had to the accompanying drawing, forming a part of this specification, in which—

(Here follows diagram marked p. 390.)

A and B are the two leaves of a shoe, which are usually closed together by means of strings or buttons over the instep. My device for fastening these two leaves together consists of a small metal plate, *a*, which is firmly secured to the leaf A by a rivet or otherwise. These plates are long enough to allow the opposite leaf, B, to lap over their ends, so that the edges of the two leaves will meet at about their middles. The opposite ends of the plates *a* are formed into an upward-projecting spring-stub, *e*, by doubling them upward upon themselves, as shown. The doubled portions are far enough apart to allow the one nearest the end to spring slightly to and from the other portion upon their being pressed together. The leaf B is provided with eyelet-holes *i*, which are placed in such a position as to be directly over the upward-projecting spring-stubs *e*, and in order to fasten the leaves together the stubs *e* are inserted into the eyelet-holes, when, by a pressure of the finger, the eyelets are forced down upon the stubs, where they are held by the springing of its two sides. In order to unfasten the shoe, the leaf which is provided with the eyelet-holes is pressed toward the opposite leaf, thus closing the spring-stub, so that the eyelet will allow it to be readily released.

Having thus described my invention, what I claim, and desire to secure by letters patent, is—

A knob or spring-stub, *e*, for fastening shoes or other articles, made by bending and swaging one end of the plate, which forms the shank or tang of the device, into the form of a goose-neck, substantially as shown and described.

In witness whereof I have hereunto set my hand and seal.

HARVEY T. LEE. [L. S.]

Witnesses:
J. L. BOONE.
WM. R. BOONE.

I. J. SAUNDERS.

Improvement in Shoe-Fastenings.

No. 129,255. Patented July 16, 1872.

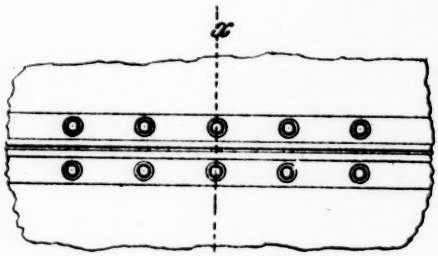

Fig. 1.

Fig. 2.

No. 289.
B. & S. Fastener Co.
N. Kraetzer.
p. 394.

Fig. 3.

Witnesses;
A. Pepper Jr.
Edwin J. Gile

Ira J. Saunders Inventor;
D. P. Holloway & Co
Attys.

395–397 129,255.

UNITED STATES PATENT OFFICE.

IRA J. SAUNDERS, of Davisville, California.

Improvement in Shoe-fastenings.

Specification forming part of Letters Patent No. 129,255, dated July 16, 1872.

To all whom it may concern:

Be it known that I, Ira J. Saunders, of Davisville, in the county of Yolo and State of California, have invented a new and useful improvement in shoe-fasteners; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby any one skilled in the art may make the same.

(Here follows diagram marked p. 394.)

Figure I is a plan view of a portion of a shoe, showing my improvement applied thereto. Fig. II is a transverse section on line *x x x* of Fig. I; and Fig. III is a perspective view of my improved fastener, shown as detached from the shoe.

This invention relates to devices for fastening together those portions of shoes and boots which are slotted for the convenience of the wearer in putting on and taking off the same; and it consists in a metallic clasp or fastener for that purpose, having upon its ends curved projections or springs for entering the holes formed in the sides of the slit or for entering eyelets placed in such holes, as will be more fully explained hereinafter.

In constructing fasteners or clasps of this character I use thin strips of steel or other suitable metal. These strips are to be cut or drawn of the proper width and thickness to form the clasp or fastener A from, it being formed, substantially as shown in Fig. 3, by having portions of its surface bent upward and a bow or spring made in it by being bent over a rod of metal, or in any other manner that will give it the proper form, after which the portion which was bent upward is turned downward, or a portion of it is, to a line parallel with the horizontal or straight portion of the fastener, when it is bent outward, so as to form a support for the eyelet. The space between the two upwardly-projecting portions should be such as to cause their outer surfaces, when forced into the hole in the shoe or boot or in the eyelet placed therein, to come in contact with such holes or eyelets, and thus be pressed together to such an extent as to cause them to act as a spring and hold them in their position when in use, but so as to prevent them from being readily displaced when the shoe or boot is to be removed from the foot.

I am aware that shoe and boot fasteners have heretofore been

made one end of which have had springs formed upon them similar to mine, while their opposite ends have been riveted to the opposite side of the slit to the one in which the holes are formed to receive the spring. That construction of fastener I do not claim; but,

Having described my invention, what I do claim, and desire to secure by letters patent, is—

The within-described fastener, it having a curved spring formed in it near both of its ends for entering the holes or eyelets in the boot or shoe, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

IRA J. SAUNDERS.

Witnesses:
FRANK W. CAMPBELL.
JUNIUS SIMONS.

C. DOWNS.
Buttons and Studs.

No. 218,864. Patented Aug. 26, 1879.

No. 289.
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v.
Kratzer.

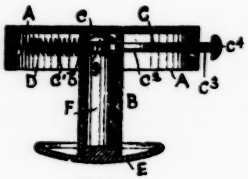


FIG. 1.

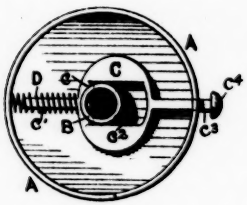


FIG. 2.

FIG. 3.

WITNESSES.

Edson Salisbury Jones.
Wm. A. Eady

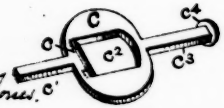


FIG. 4.

INVENTOR.

Chas. Downs

399 UNITED STATES PATENT OFFICE.

CHARLES DOWNS, of Providence, Rhode Island.

Improvement in Buttons and Studs.

Specification forming part of Letters Patent No. 218,864, dated August 26, 1879. Application filed July 28, 1879.

To all whom it may concern:

Be it known that I, Charles Downs, of the city and county of Providence, and State of Rhode Island, have invented a new and useful improvement in buttons and studs; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, forming a part of the same, is a full, clear, and exact description thereof.

My invention relates to that class of buttons and studs which are made in two separable parts, for convenience of application and removal, and to that variety in which the parts are fastened together by a spring-locking device or devices operated, when the parts of the button are to be separated, by a pusher or pushers extending radially beyond the head of the button.

My improvement consists in simplifying the construction of such a button by so shaping and mounting the locking device that it is guided and retained in position by the stem attached to the head of the button, or by the actuating-spring and the rim of the head, thereby dispensing with a guard or guide plate for the purpose.

My improvement is applicable to collar-buttons, sleeve-buttons, studs, &c.; but for the purpose of illustrating my invention I have chosen a sleeve-button, which is represented at figure 1 of the drawings in partial vertical section. Fig. 2 shows a view of the under side of the button-head. Fig. 3 represents the stem in perspective, and Fig. 4 the locking-plate in perspective.

(Here follows diagram marked p. 398.)

Referring to the drawings, A denotes the head of the button, and B the tubular stem attached thereto. As shown at Figs. 1 and 3, the stem B is provided, near its base, with a slot, *b*, into which a portion, *c*, of the sliding locking-plate C enters by the force of a spring, D, which surrounds a tail-piece, c^1, on the plate, C, and takes bearing against the rim of the button-head. This plate is provided with a slot, c^2, of a width equal, or nearly equal, to the exterior diameter of the stem B, and is furnished with a member or pusher, c^3, which projects radially through and beyond the rim of the button-head, so that the plate may be moved longitudinally by the fingers. The remaining parts of the button consist of a shoe, E, and a post, F, attached to said shoe, and provided with a shouldered head, *f*, with which the portion *c* of the locking-plate can engage

when the parts of the button are combined, and thereby prevent them from separating until the said plate is properly moved. The amount of longitudinal movement of this plate is limited in one direction by the contact of the end of the tail-piece c^1 with the interior of the button-rim, or by the contact of the head c^4 of the pusher with the exterior of the rim, (preferably the latter,) the amount of movement being insufficient to allow the portion *c* to pass entirely out of the slot *b* in the stem. In the other direction the movement is limited by the contact of the face of the portion *c* with the vertical walls of the slot *b*.

It will thus be seen that the locking-plate C is confined vertically in position by the engagement of the portion *c* with the slot *b*, aided by the bearing of the pusher in the rim of the button-head.

The plate C may be laterally guided in three ways without materially varying the construction: first, by making the width of the slot c^2 equal to the exterior diameter of the stem, as above specified, so that the stem shall guide the plate by the engagement of its periphery with the sides of the slot; second, by making the width of the portion *c* of the plate less than the interior diameter of the stem, as shown by dotted lines in Fig. 4, and making the vertical walls of the slot *b* parallel with and in engagement with the sides of the said portion; and, third, by securing the spring D to the rim of the button, and making the tail-piece c^1 nearly equal in length to the spring, as shown, the width of the slot c^2 being immaterial. By this latter method one end of the plate is guided by the bearing of the pusher c^3 in the rim of the button-head, and the other end by the coils of the spring D. Either of the above methods of laterally guiding the plate C is within the spirit of my invention.

Although in the drawings, and as thus far described, I have shown only one locking-plate, yet two may be employed, one overlying the other, it only being necessary to remove the tail-piece c^1 on each plate a little to either side of the diametrical line occupied by the pushers to prevent contact, and to bring the portion *c* on each plate into the same plane, that both may engage the shouldered head *f* of the post F, the stem being supplied with a second slot, *b*.

400 & 401

Having described my invention, what I claim, and desire to secure by letters patent, is—

1. In a separable button or stud, the combination, with the shoe E and post F, of the head A, slotted stem B, actuating-spring D, and sliding locking-plate C, adapted to receive the spring, as shown, provided with a pusher, c^3, a portion, *c*, for engaging the post, and a slot, c^2, whose width is equal to the exterior diameter of the stem B, whereby the said plate is laterally guided, substantially as described and shown.

2. In a separable button or stud, the combination, with the shoe E and post F, of the head A, slotted stem B, actuating-spring D, and slotted locking-plate C, adapted to receive the spring, as shown, provided with a pusher, c^3, and with a portion, *c*, which engages the vertical walls of the slot in the stem and laterally guides the plate, substantially as set forth.

3. In a separable button or stud, the combination, with the shoe E and post F, of the head A, slotted stem B, actuating-spring D, secured to the button-head, and slotted locking-plate C, provided with a pusher, c^3, which takes bearing in the button-head, with a portion, *c*, for engaging the post, and with a tail-piece, c^1, which enters the spring D, as described and shown, and assists in laterally guiding the plate, substantially as set forth.

CHAS. DOWNS.

Witnesses:
EDSON SALISBURY JONES.
WM. A. CADY.

403

UNITED STATES PATENT OFFICE.

HENRY A. CHURCH, of Providence, Rhode Island.

Lacing-hook.

Specification forming part of Letters Patent No. 227,094, dated May 4, 1880. Application filed March 31, 1880. (Model.)

To all whom it may concern:

Be it known that I, Henry A. Church, of the city of Providence, county of Providence, and State of Rhode Island, have invented a new and useful improvement in lacing-hooks, and in the art of making the same; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to improvements in the art of making lacing-hooks, by means of which the same may be made of steel or low iron, and a stronger, better, and cheaper article produced. It also has reference to improvements in the lacing-hook by which the weight of the hook is reduced and the strength increased, while the hook can be more readily and more firmly secured in place.

(Here follows diagram marked p. 402.)

Figure 1 is a plan and sectional view of a blank of sheet-steel or refined iron, in which four slits are cut at the place where the tubular rivet is to be formed. Fig. 2 shows the blank in full view, also in section, after the second step of the process in forming the semispherical cup has been performed. Fig. 3 is a view of and also a section of the blank after the third step in the process of drawing the tubular rivet has been performed. Fig. 4 is a view of and a section of the blank after the fourth step in the process of cutting off the end of the tubular rivet has been taken. Fig. 5 is a view and a section of the blank after the fifth step in the process has been performed. Fig. 6 is a view and a section of the finished lacing-hook after the sixth step of the process has been performed. Fig. 7 is a view, partly in section, showing the lacing-hook secured to the material; and Fig. 8 is a bottom view of the same.

Heretofore lacing-hooks for shoes have ordinarily been made of brass or similar soft metal, and afterward coated with a black enamel, that they may harmonize with the color of the shoe.

Lacing-hooks thus constructed have been found objectionable in use, owing to the fact that the enamel soon wears off and leaves the bright and shining metal fully exposed to view.

To obviate this difficulty, secure greater strength and stiffness, and reduce the first cost of the material, I make my improved lacing-hooks of homogeneous steel or refined iron, the natural color of which is not so objectionable as the color of brass, the strength of

No. 289.
O. K. S. Fastener Co. } A. 402.
Kratzer.

(Model.)

H. A. CHURCH.

Lacing-Hook.

No. 227,094. Patented May 4, 1880.

Fig. 1.

Fig. 2.

Fig. 3.

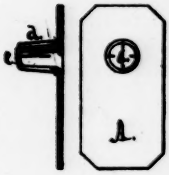


Fig. 4.

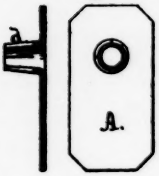


Fig. 5.

Fig. 6.

Fig. 7

Fig. 8.

WITNESSES:

Joseph A. Mylius Jr.

William H. Cook.

INVENTOR:

Henry A. Church.

by Jos. A. Miller.

Atty

which is much superior and the cost much below the cost of the metals heretofore used.

Homogeneous steel and refined iron cannot be drawn and stamped into the forms required for lacing-hooks as readily while cold as brass or similar metal, and to produce the finished hook the various steps in the process must be arranged with a view to the greater tenacity of the material; and to facilitate the manufacture I stamp into the blank A, of soft homogeneous steel or refined iron, the slits *b b* at the place where the tubular rivet is to be formed, as is shown in Fig. 1, and by thus separating the material the flow of the metal, when under pressure, is facilitated, and the semi-spherical cup shown in Fig. 2 is more readily formed and with less pressure than would be possible if the slits *b b* had not been first cut.

The spherical cup *c* is made of considerable larger diameter than the tubular rivet which is to be formed out of the metal of the cup *c*.

The metal composing that portion of the cup adjoining the blank is compressed while the drawing-out dies are being operated to elongate the tubular rivet, which is first formed with a closed end, *e*, as illustrated in Fig. 3, which end is afterward removed, causing the blank to appear as shown in Fig. 4. All these operations have been performed to produce the tubular rivet *d*, and the hook is still to be formed. The blank A, as shown in Fig. 4, is now subjected to pressure in a die, and the rounded button *f* and the raised rib *g* are formed as is shown in Fig. 5, both in view and section. *g'* is a section through the line 1 2. The blank is now bent into the hook form shown in Fig. 6. The raised rib *g*, extending from the tubular rivet to the button *f*, increases the strength and stiffness of the neck and prevents the closing of the hook, to which hooks of the old construction are liable, and which is a great annoyance in the use of lacing-hooks.

When these improved lacing-hooks are to be secured to boots, shoes, or other articles, the slits *b b* allow the tubular rivet to open more readily than when the tube is solid, and they will turn over and enter the leather, as shown in Fig. 7, holding the hook more firmly.

404 & 405

A tubular rivet or eyelet, when secured, forms a flange somewhat larger than the hole in the material, since the excessive strain, particularly the lateral strain exerted on a lacing-hook, has a tendency to force the flange at the point opposite the hook through the hole and loosen the hook.

My improved hook has no such tendency, as the four bands enter the material at a greater distance from the hole, and are clinched so as to firmly hold the material, as is shown in Figs. 7 and 8. These hooks may be made in the improved form, of any material now used for lacing hooks, and they will be stronger, stiffer, and can be better secured than lacing-hooks as heretofore made; but I prefer to make the lacing-hooks of homogeneous steel or refined iron, as they are stiffer, stronger, cheaper, and better suited for boots and shoes.

Having thus described my invention, I claim as new and desire to secure by letters patent—

1. The method of making lacing-hooks, substantially as hereinbefore set forth, the same consisting, essentially, in first forming diverging slits in one end of the blank; second, in stamping a cup from such slitted portion; third, in drawing out a tubular rivet from said cup; fourth, in removing the closed end of the rivet; fifth, in stamping the raised rib *g* and button *f;* and, sixth, in bending the button to the required shape, substantially as set forth.

2. A lacing-hook consisting of a tubular pronged rivet and a button connected with said rivet by a neck re-enforced by a rib, substantially as set forth.

HENRY A. CHURCH.

Witnesses:
JOSEPH A. MILLER.
J. A. MILLER, JR.

(No Model.)

E. PRINGLE.

BUTTON FOR GLOVES.

No. 260,411. Patented July 4, 1882.

No. 289.
R. S. Eastman Co. p. 406
v.
Knaffer

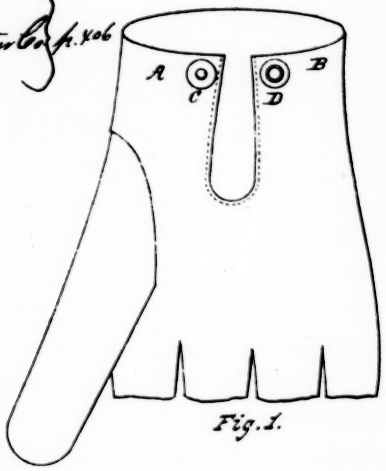


Fig. 1.

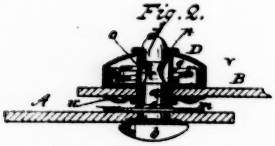


Fig. 2.

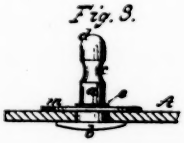


Fig. 3.

Fig. 5.

Fig. 4.

Fig. 6.

Witnesses:
Richard F. Dumary
Charles Dennick

Eugene Pringle
Inventor.
by his Attys.
Atty. Abbott

407 UNITED STATES PATENT OFFICE.

EUGENE PRINGLE, of Gloversville, New York.

Button for Gloves.

Specification forming part of Letters Patent No. 260,411, dated July 4, 1882. Application filed January 24, 1881. (No model.)

To all whom it may concern:

Be it known that I, Eugene Pringle, a citizen of the United States, residing in Gloversville, in the county of Fulton and State of New York, have invented certain new and useful improvements in buttons for gloves, &c., of which the following is a specification.

My invention relates to that class of buttons known as "sectional" or "detachable" buttons, in which one section or part of the button is composed of a base and stud which operates in conjunction with another section composed of a button-head and stud-receiving device held together by catching device; and it consists of certain improvements in which the stud of the base-section is provided with an annular groove which operates in conjunction with a shell button-head provided with a tubular stud having a side opening and a spring-catch which works through said side opening and into said annular groove, made with the stud of the base-section, as I will more particularly describe hereinafter.

The object of my improvement is to provide means by which the detachable sections of the button may be readily united or detached from each other by simply pushing the parts toward each other or drawing them from each other without exerting any pressure on any part or adjunct of the button. I attain this object by means of the mechanism illustrated in the accompanying drawings, in which the same letters of reference refer to like parts throughout the several figures, in which—

(Here follows diagram marked p. 406.)

Figure 1 represents a glove with the parts of my improved button attached thereto. Fig. 2 is a sectional elevation of the coacting parts on an enlarged scale. Fig. 3 is a sectional elevation of the base and stud portion of the button. Fig. 4 is a sectional elevation of the stud-tube employed with the head-section of the button. Fig. 5 is a plan view of the internal parts of the head-section of the button, illustrating their form and arrangements in relation to each other; and Fig. 6 is a sectional elevation.

In the drawings, A and B represent the two pieces of fabric to be united together by means of my improved button, and C and D are the sectional parts of the button. The part C (shown in Figs. 2 and 3) is composed of the cylindrical stud *a* and base *b*, which parts may be made separately and secured together in the manner practiced by the trade, or be made solid with each other, as shown

in Fig. 3. The upper and terminating end *d* of said stud is made convex, or with a semi-spherical form, and is provided with an annular concave groove, *c*.

To secure the base portion or section C of the button to the fabric, there is provided on the body of the stud *a*, from the upper side of the base, an annular projecting step, *e*, which extends to a short distance above the upper side of said base, and a thin washer, *m*, having a central perforation which nicely fits the said step *e*, is also provided. When the stud *a* is passed through the fabric A at a point at which it is to remain secured to it (the fabric) the washer *m* is slipped on said stud and down past step *e* on the upper surface of the fabric, when the operator will with suitable instrument or tool upset the shoulder of said step and clinch it down on the said washer, when the base-section of the button will be securely attached to the fabric, as shown.

The coacting section or portion D of the button is the button-head, and it is composed of a chambered shell-head, *g*, provided with a central stud-receiving tube, *n*, held in connection with said head and projecting upward within the shell of the same from the lower or under side of said head to, or near to, the upper side thereof, as shown in Figs. 2 and 6.

Made in one side of the tube *n* is a horizontal slot, *o*, having a width of vertical extension sufficiently large to receive the catching-limb *s* of spring *u*, and with a horizontal extension inward from the outside of said tube toward its center a little less than one-half of the diameter of the same, as shown.

The spring *u* is made substantially in the form shown in Fig. 5, and has its limb *s* resting in the horizontal slot *o* of tube *n*, and its opposite end limb, *r*, bearing on the outer opposite side of said tube, while its intermediate curved portion, *t*, occupies the chamber of the head surrounding said tube, as shown. The spring *u* is held within the chamber of the head by the closing-plate *v*, which plate is held in secure connection with the head of the button by the upper end of tube *n* being passed from the button-head shell and through the closing-plate *v*, and clinched on washer *w* below after the fabric B is interposed between said base or closing plate and said washer. If preferred, the lower end of the tube *n* may be clinched on the lower side of the closing-plate *v* and the washer be dispensed with.

408 & 409

In Fig. 6 the head of the button is shown to be made with a chamber having its lower marginal edge clinching over the outer edge of the closing-plate *v*, which closing-plate is shown to have a stud-receiving tube, *n*, made with it, while the upper end of said tube terminates at the lower side of the top portion of the shell of said head, and the horizontal slot *o* is made the same as before described, and the spring *u* is shown to be inverted from the position shown in Fig. 2; but its catching-limb *s* rests in slot *o* of the tube *n* the same as before described.

When it is preferred to make the base-stud C removable from the fabric the annular projecting step *e* and washer *m* of said base-

section may be omitted, and eyelet-holes made in the parts of the fabric to be united may be employed.

When it is desired to connect the portions or sections C and D of the button the operator will place the latter over the former and cause stud *a* of the former to enter tube *n* until the convex end *d* of the said stud has passed the catching-limb *s* of spring *u*, when said catching-limb will fall into the concave annular groove *c* of the stud and catch with the same, and thereby hold section D with section C of the button.

It will be observed that the spring *u* in all its portions is inclosed within a chamber and cannot be in the least disturbed or displaced, and that the catching-limb *s* of said spring will in all cases be held in the horizontal slot *o* of the stud-receiving tube for immediate action with the annular concave groove *c* of stud *a*.

It will also be readily observed that by reason of the slope or convexity of the end *d* of the stud *a* a gentle pressure of the sections C and D toward each other will be sufficient to cause the spring catching-limb *s* to be crowded outward until said catching-limb is opposite the annular concave groove *c*, when the tension of the spring will cause the said catching-limb to engage with said groove.

It will also be readily observed that the upper and lower horizontal sides of said catching-limb of the spring will at all times be held between the upper and lower sides or lips of the horizontal slot *o*, so as to retain the said catching-limb in the same relative position and situation for action with the concave groove *c*.

It will be further observed that by reason of the slope or concavity of the sides of groove *c* and the convexity of the catching-limb *s* of the spring they will act with each so as to throw the latter out from the former when the two sections C and D of the button are drawn on in opposite directions, and that the use of devices for throwing the catch out of engagement with the groove of the stud is obviated.

The spring *u*, in all its portions being made of round spring-wire, will operate the same in all its parts, and, being bent in the form shown, will be sufficiently elastic to cause the catching-limb *s* to readily pass over the head of the stud under slight pressure, and at the same time have sufficient tension to cause said limb to engage with the groove of the stud, so that the upper section, D, will not become accidentally disengaged from the lower section, C.

I am aware that in buttons made with detachable halves or sections studs made with a base-piece, and having spherical or semi-spherical upper ends, and with necks for engaging with a catch, are old and well known.

I am also aware that in sectional buttons catches operated in one direction by springs to hold them in engagement with the studs, and operated in an opposite direction to effect their disengagement from the stud, are also well known.

I am also aware that catches engaging with a stud of the base or lower half of detachable buttons by means of a circular moving piece are also old. I therefore do not claim broadly as my inven-

tion studs having sloping or semi-spherical heads with necks, and catches engaging with the same.

What I claim, and desire to secure by letters patent, is—

In a separable or detachable button, the combination, with the base-section C, having a stud which is provided with a sloping or semi-spherical head and annular concave groove *c* below said head, of the head-section D, having a stud-receiving tube provided with horizontal slot *o*, and the spring *u*, having its limb *s* resting in said slot and its body held within an inclosed chamber surrounding said slotted tube, all for operating substantially as and for the purpose set forth.

EUGENE PRINGLE.

Witnesses:
WM. H. DYE.
GEORGE C. MOORE.

(No Model.)

J. W. MEAKER.

FASTENING FOR POCKET BOOKS, &c.

No. 266,710. Patented Oct. 31, 1882.

Fig. 1.

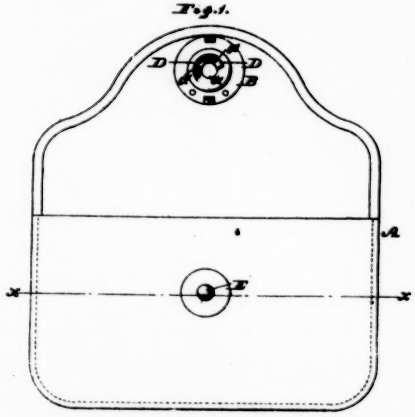


Fig. 2.

Fig. 3.

Fig. 4.

No. 289.
P. & S. Fastener Co. } p. 410.
v.
Kratzer.

WITNESSES:

A. P. Brand,
H. C. Fischer

INVENTOR:

John W. Meaker,
by Munn & Co.
ATTORNEYS.

411 UNITED STATES PATENT OFFICE.

JOHN W. MEAKER, of Philadelphia, Pennsylvania.

Fastening for Pocket-books, &c.

Specification forming part of Letters Patent No. 266,710, dated October 31, 1882. Application filed June 21, 1882. (No model.)

To all whom it may concern:

Be it known that I, John W. Meaker, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful improvement in fastenings or locks for pocket-books, bags, &c., which improvement is fully set forth in the following specification and accompanying drawings, in which—

(Here follows diagram marked p. 410.)

Figure 1 is a face view of the fastening or lock embodying my invention as applied to a pocket-book shown open. Fig. 2 is a section in line *x x*, Fig. 1, the pocket-book being closed. Fig. 3 is a view of one part of the fastening or lock on the side opposite to that shown in Fig. 1. Fig. 4 is a view of a modification thereof.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a fastening or lock for a pocket-book, bag, &c., formed of a button and a spring-tongue—one or more—the latter attached to one part of the book, bag, &c., having its end occupy such position that it is in the path of the button, whereby the parts may readily engage and be securely connected, the security of the hold increasing as the book or bag, &c., is distended, the entire device being of simple and inexpensive construction, and levers, cams, and similar fastening or locking devices are avoided, the construction and operation being hereinafter fully set forth.

Referring to the drawings, A represents a pocket-book of ordinary construction, to which, however, my invention is not limited, as it is equally applicable to bags and other receptacles and articles to be fastened or locked.

B represents a cap, centrally perforated, and of somewhat dishing shape, the same being secured to the under or inner side flap of the book; and C represents a plate which is fitted within the cap and attached thereto. The corners of the plate are continued inwardly, forming spring-tongues D D, of which two are shown, their ends being separated and facing each other and approaching the center of the cap, so as to appear at the perforation *a* thereof.

To the outer face of the body of the book is secured a button, E, whose head is of less diameter than the opening or perforation *a* of the cap B, so as to enter the same and pass through the space be-

tween the ends of the spring-tongues D, said ends primarily obstructing the path of the button.

The operation is as follows: When the book is to be closed and fastened or locked the flap is advanced toward the body of the book, or *vice versa*, and the head of the button E guided into the opening *a*. The ends of the spring-tongues yield and permit the passage of the head of the button until said ends reach the neck of the button, when they spring into said neck, thus locking the button and fastening the flap, the head of the button being entirely inclosed and concealed.

It will be seen that the attachment of the button and cap, and consequently of the flap and body, is secure and reliable. The book may be bent without releasing the cap or button, and the distention of the book by the contents thereof only serves to force the cap more firmly against the button, or *vice versa*, whereby opening of the distended or occupied book when security thereof is most necessary is prevented.

In order to open the book, pressure is exerted on the flap or body to separate one from the other, whereby the holding-power of the spring-tongues is overcome, the tongues clear the head of the button, and the button emerges from the opening in the cap, thus fully disengaging the button and cap and unfastening or unlocking the flap, as is evident.

In order to allow play of the spring-tongues at their ends adjacent to the central opening, *a*, of the cap, the wall of said opening is slotted, as at *a'*, at places coinciding with said ends, so that the latter are permitted to move outwardly when under pressure of the head of the button, the inward motion of the ends of the tongues being permitted by the dishing or depressed form of the cap, the freedom of said ends thus being preserved.

The means for attaching the cap to the flap may be varied, clips, prongs, &c., being employed for my purpose, as most desirable. In Fig. 4 the cap is enlarged or elongated and provided with two sets of spring-tongues, in which case one button will be employed, and the device is adapted to be applied to pocket-books, &c., requiring unusual expansion, and where different points of attachment are essential.

412 & 413 If desired, the tongues D may be secured directly to the inner face of the flap and a cap or plate attached to the outer face of said flap, in which case the flap will be perforated at the place coinciding with the space between the ends of the spring-tongues, so as to permit the passage of the head of the button to a locking position with said tongues.

The plate C is attached to cap B and rests against the back of the same, the place of attachment being at the side of the plate opposite to the spring-tongues, so that both the body of the plate and the spring-tongues move under the action of the head of the button. By this provision the tongues have increased length. Their resiliency is increased also. There are enlarged and strong means of attachment of the plate C without piercing or otherwise weakening the tongues, and the neck of the button is forced against the

wall of the central opening in the cap B, thus causing the latter, as well as the spring-tongues, to sustain the button when in a locked position.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

The improved fastening for pocket-books, &c., consisting of a cap having a perforation the wall of which has slots, substantially as described, a button and spring-tongues, the button being adapted to be held both by the said wall and tongues, and the ends of the tongues vibrating or playing in the aforesaid slots, for the purpose stated.

JOHN W. MEAKER.

Witnesses:
JOHN A. WIEDERSHEIM.
A. P. GRANT.

415 UNITED STATES PATENT OFFICE.

GEORGE J. CAPEWELL, of West Cheshire, Connecticut.

Letters Patent No. 62001, dated February 12, 1867; Reissue No. 3307, dated February 23, 1869.

Improvement in Button-fastenings.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, George J. Capewell, of West Cheshire, in the county of New Haven, and State of Connecticut, have invented a new and useful "improvement in the construction and manufacture of buttons;" and I do hereby declare the following to be a full and exact description of the same, reference being had to the drawings which accompany and form a part of this specification.

The object of the present invention is to construct buttons in such manner that, without sewing or stitching, they can be readily attached to textile or other fabrics, leather, or other material suitable to receive them.

And, by the present invention for the object stated, a button is made in two parts—the one, the button proper, and the other the shank which is then the fastening-device; or, the one, the button proper, and shank in one piece, and the other the fastening device, that are, relatively, so constructed, that while such parts, when placed, the one upon the other, in a proper manner, and power, or force is applied, will become firmly, strongly, and rigidly secured or fastened together by my improved construction. When the button is applied to cloth, leather, &c., it extends entirely through it, from one side to the other; and when fastened, or secured, as before stated, confines the cloth between the outer and inner ends of the button and its fastenings.

In the accompanying plate of drawings, my "improvement in the construction of buttons" is illustrated—

(Here follows diagram marked p. 414.)

Figure 1 being a central section through a button constructed thereto, showing its two parts fastened together in a piece of cloth, with a washer upon one side of the cloth.

Figure 2, a similar sectional view to that of Fig 1, but showing the button without the washer.

Figures 3 and 4, similar sectional views to the Figs. 1 and 2, preceding, showing, however, a modification in the construction and application of the button, to be hereinafter particularly described, the one without, and the other with a washer.

G. J. Caperell,

Button.

No 3307. No. 289. U.S. Patent Office } p. 44 Reissued Feb 23, 1869

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

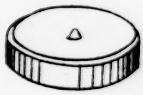
FIG. 5.

FIG. 6.

FIG. 7.

FIG. 9.

FIG. 8.



Witnesses.
Albert W. Brown,
H. L. Wattenberg

Inventor.
G. J. Caperell
by Munn & Co
Attys.

Figure 5, a similar sectional view of a button to the figures preceding, showing a modification in the construction of it.

Figure 6, a plan view of the button upon its inner, or rear end.

Figure 7, a sectional view of the two parts to a button, constructed according to my invention, before attached, or secured together,

Figure 8, a perspective view of a combined bodkin and die, or punch, for securing my buttons to cloth, &c.

Figure 9, a perspective view of a bed-piece, or anvil-block, adapted for use in connection with the punch, or die shown in the preceding figure, to fasten the two parts of the button together.

A, in the drawings, represents the front plate of a button, or the button proper, which, in the present instance, is shown as made hollow, and upon its rear side, open at the centre B, at which point the front plate A, of the button, upon its inner face, is shown as made or provided with a conical-shaped teat, or protuberance, C.

D, the shank, or fastening-part of the button, which shank D is of the form of an eyelet, with a flange, E, at one end.

To attach the two parts, A and D, of the button together, the open end F, of the eyelet-shank D, is placed within the opening B, of the button proper, A, resting, by its end, against the conical teat C thereof, when, by applying force, power, or pressure to the outer, or flanged end E, of the eyelet-shank D, the end of the eyelet within the button proper, is, by the cone-teat, made to spread out within the button proper, beyond the edges of its openings B, thus effecting the fastening and securing of the two together, and in a most rigid, firm, and strong manner.

In the several figures of the drawings, this fastening together of the two parts of the button is shown in connection with a piece of cloth, through which the eyelet-shank is first passed before the button proper is fastened to it, as has been just above described, if it is desired to apply the button thereto.

For facilitating this insertion of the eyelet-shank in the cloth, a hole is first made in it with the bodkin, shown in Fig. 9.

If increased protection from injury to the cloth is desired, or necessary, a washer may be used upon the eyelet-shank, under its flange-end, between it and the cloth, as shown in Figs. 4, 5, and 6.

For forcing the eyelet-shank within the button proper, the die, or punch, *h*, shown in Fig. 8 of the drawings, is used in the flanged-end of the eyelet; and, in using the said die, care should be taken to observe that the end of the eyelet-shank, within the button proper, first sets rightly, or "squarely," as it were, upon the cone therein, so that an even swaging, or spreading out of the eyelet can be secured. And also, care must be taken to observe whether the eyelet-shank has been swaged or spread, within the button proper, to form a flange of a sufficient extent to insure the holding together of the two parts of the button, or otherwise the buttons will be liable to rip, or break off, or apart.

By pressing or forcing the eyelet into the button proper with a greater or lesser amount of force, it is obvious that less or more space, between the back of the button and the cloth, will be left, and this,

of course, is to be regulated according to the circumstances of each particular case where the buttons are applied and are to be employed.

In the buttons shown in Figs. 2 and 4, two eyelets, the one within the other, are there shown as employed, the object being to give firmness and stiffness to the shank. And, by using an inner eyelet of a greater length than the outer one, with the cloth between their flanged ends, sufficient space is secured for the buttoning-cloth to be buttoned over the buttons.

416 & 417

In Fig. 5, the form there shown is suitable for being covered with cloth, the front of the button proper being made of two thicknesses of sheet-metal, with the outer one plane, and the inner one provided with a cone-teat, or protuberance, as shown, for producing the swaging, or spreading of the eyelet-shank within the button proper.

In the several figures of the drawings, the buttons there shown, are made or supposed to be made of sheet-metal; but, in lieu of sheet-metal, other materials, such as horn, ivory, vulcanized india rubber, or gutta-percha, cast-metal, or any other substance or substances, either singular or compounded together, that may be suitable or proper for use as buttons may be employed; and at the centre of such button material, the conical teat, or protuberance, is made for producing the spreading of the shank within it when the two are attached together.

And, in lieu of having the shank independent of the button proper, as has been hereinabove described, the shank and button proper may form one part, and then, over the end of the shank, a plate, or disk fastened in the same manner as that described for fastening the button proper to the shank, and by means of a similar, or equivalent interior construction of the said disk, or plate, that, when force is applied to the eyelet, or to the said disk, will allow or cause such eyelet to be spread out, or swaged around, within the said disk, beyond the edges of its opening, made to receive the end of the eyelet-shank; the operation, effect, and principle being the same, in this instance, as in the construction of the button proper fastening the shank in it; the only difference being, that in lieu of the button proper, or plate being the one thus fastened, it is a plate, or disk back of the button or cloth.

And it may be here remembered, that, in the manufacture of the button proper, or head, or plate, *a*, any of the modes now in general use or practice may be employed, the present invention not relating, in any manner, to the mode of producing a button, but simply to its construction relatively to a fastening-device for securing it to cloth, &c., without stitching, or securing.

Having thus described my improvement,

What I claim as my invention, is—

1. A button, or button-head, having a recess of inverted-cone form, made in its inner side, to receive an eyelet, or hollow shank, or tube, which when pressed into said conical recess, will expand radially, and be firmly connected to the button, and, at the same time, secure the button to the garment or fabric, substantially as described.

2. The combination of an eyelet, or hollow shank, with a cone *e*, or its equivalent, either with or without a washer, substantially as and for the purpose specified.

3. The combination of two or more eyelets, with the cone C, or its equivalent, of a button, and either with or without a washer, when arranged and combined for action, and for fastening the cloth, &c., between their two ends, substantially as specified.

GEORGE J. CAPEWELL.

Witnesses:
EDW'D A. CORNWALL.
THOMAS E. CORNWALL.

419-421 118,640.

UNITED STATES PATENT OFFICE.

CLARK M. PLATT, of Waterbury, Connecticut.

Improvement in Eyelets for Attaching Buttons to Textile Fabrics.

Specification forming part of Letters Patent No. 118,640, dated August 29, 1871.

To all whom it may concern:

Be it known that I, Clark M. Platt, of Waterbury, in the county of New Haven and State of Connecticut, have, as I believe, invented new and useful improvements in eyelets for attaching buttons to textile fabrics; and I do hereby declare the following to be a full and exact description of the same, reference being had to the drawing that accompanies and forms part of this specification.

(Here follows diagram marked p. 418.)

Figure 1 presents the two parts of my eyelet separate and the same put together, forming the article complete; Fig. 2, longitudinal section of the same, exhibiting the manner of attaching the parts; Fig. 3, some of these eyelets in their place with the other parts of the button.

A represents the stem or tubular part of the eyelet; B, a cap to one end of the stem A, so formed and attached as to provide an extended flange to that end; *c*, a flange spreading outwardly upon that end of the tubular part A which is to receive the cap B; *e*, the portion of the cap B which is turned inwardly and made to overlap the flange *c*, and thus fasten the said cap B to the part A; F, front plate of a double-plated metallic button; *g*, a convex or cone-shaped swell upon the central portion of the inner or rear side of this plate F; H, the rear plate of this button; I, the outer plate of a button of different form from F; J, the rear plate belonging to I.

One object of my invention is to provide upon that end of the eyelet which does not enter the button-plates a wide-spread flange to rest upon the cloth or fabric—one that shall be sufficient to prevent the button from being torn off and not require a washer beneath said flange. Another object is to avoid the rough and ragged edge of *of* the ordinary outwardly-spreading flange, and to present a more comely appearance.

My design is carried out by forming the flange *c* upon one end of the tube or stem A, then forming a cap, B, much larger across than the diameter of the tube A, which, being fashioned and attached to the part A, as illustrated in the drawing, provides an extended surface to rest upon the fabric and a smooth and comely cap or head.

[121.]

Clark M. Platt

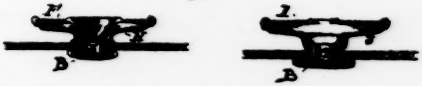
Improved Eyelet for Buttons.

No. 118,640. Patented Aug. 29, 1871.

Fig. 1.

Fig. 2

Fig. 3.



No. 289. B & L. Fastener. v. Kraitzer. } p. 418

Witnesses:
Fred. Artois
Hum Lauten

Inventor:
Clark M. Platt.
By D. C. Colby & Son
Attorneys

These eyelets will be found very desirable not only as affording greater strength and more desirable finish in use in connection with the two styles of buttons exhibited in the drawing, but in use with any others which have the eyelet inserted at the time the button is attached to the fabric.

What I claim as my invention, and desire to secure by letters patent, is—

As a new article of manufacture, an eyelet, constructed as described and set forth—that is, of tubular stem and cap united, as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CLARK M. PLATT.

Witnesses:
CHAS. W. GILLETTE.
R. W. AYRES.

423–425 UNITED STATES PATENT OFFICE.

DAVID ESSEX, of Corona, New Jersey.

Corset-clasp.

Specification forming part of Letters Patent No. 235,144, dated December 7, 1880. Application filed February 25, 1880.

To all whom it may concern:

Be it known that I, David Essex, of Corona, Bergen county, State of New Jersey, have invented an improved corset-steel clasp or fastening, of which the following is a specification.

The object of my invention is to present a corset-fastening which will not become accidentally disengaged. This I accomplish by combining with the eye-plate a flat spring, which by its tension prevents the stud when engaged in the eye-plate from becoming disengaged.

My improvement is shown in the accompanying drawings, in which—

(Here follows diagram marked p. 422.)

Figure 1 is a plan view, showing a portion of a pair of corset-steels provided with my improved clasp, which is disengaged. Fig. 2 shows the same engaged. Fig. 3 is a sectional view of Fig. 2 at *x x*. Fig. 4 is a plan view of a portion of a corset-steel provided with my improved plate and spring.

In the several figures like letters indicate like parts.

A A′ are portions of two corset-steels. B is my improved eye-plate. C is the spring provided with the lip *c*, which is designed to catch upon the eye-plate and to keep the spring in position. This lip may catch anywhere upon the front or side of the eye-plate, as shown at *c c* in Figs. 3 4.

e e′ indicate the points at which the spring and eye-plate are riveted to the steel. *f* is the stud, provided with the head *b* and the shoulder *b′*, which is adapted to hold the stud in position upon the surface of the steel to which it is riveted.

The spring C is curved away from the eye-plate to secure the desired tension, and is provided with an opening to admit the passage of the stud.

The eye-plate B is provided with the curve or double curve, as shown, and with the openings *d d′*.

The object of this peculiar form of eye-plate is to carry the opening *d′*, the material surrounding which is depressed, as shown, away from the surface of the steel A′, and to allow the head *b* of the stub *f* to rest securely in the same.

The spring C and eye-plate B may both be riveted upon the surface of the steel, as shown in Fig. 3, upon opposite surfaces, and thus

D. ESSEX.

Corset Clasp.

No. 235,144. Patented Dec. 7, 1880.

Fig 1.

Fig. 2.

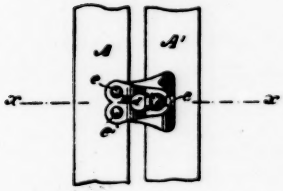
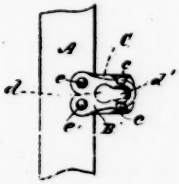


Fig. 3.

Fig 4



No. 235,144 B. & L. Fastener Co. } p. 422.
Kraetzer.

Witnesses:
Henry Dilling
M. F. Clifton

Inventor:
David Essex jr.
John Francis Meyer,
Att'y.

serve to strengthen the same at the point at which it frequently breaks—to wit, across the line of the rivets.

To operate my clasp, place the spring and eye-plate in position so that the larger part, *d*, of the opening in the eye-plate falls over the head of the stud, the spring resting upon the steel A′; then bring to bear upon the spring-surface sufficient pressure to raise the head of the stud through the opening *d*; then draw the steels apart, and at the same time release the pressure, so that the head *b* of the stud falls into the opening *d*′, where it will remain securely locked.

The advantage of my improved clasp over the ordinary eye-plate and stud is that no ordinary or casual pressure upon the steels or any portion of them will serve to cause the same to become disengaged, as is the case with the ordinary clasp or fastening.

What I claim is—

1. The spring C, eye-plate B, stud *f*, and steels A A′, combined and arranged to operate substantially as and for the purposes set forth.

2. In a corset-fastening, the eye-plate B, as shown, and provided with the openings *d d*′, the material surrounding said opening *d*′ being depressed, as described, adapted to operate in connection with the stud *f*, as set forth.

3. The spring C, provided with the lip *c*, adapted to catch upon the eye-plate B and lock the head *b* of the stud *f* in the opening *d*′, as set forth.

4. The eye-plate B and spring C, riveted upon opposite sides of the steel A, and adapted to strengthen the same.

DAVID ESSEX.

Witnesses:
JAMES J. LYONS.
HENRY EICHLING.

427 UNITED STATES PATENT OFFICE.

THEODORE C. BATES, of North Brookfield, assignor of one-half to David H. Fanning, of Worcester, Massachusetts.

Corset-steel Fastening.

Specification forming part of Letters Patent No. 236,663, dated January 18, 1881. Application filed September 29, 1880. (Model.)

To all whom it may concern:

Be it known that I, Theodore C. Bates, of North Brookfield, Massachusetts, have invented an improvement in corset-steel fastenings, of which the following description, taken in connection with the accompanying drawings, is a specification.

This invention relates to corset-steel fastenings, and is an improvement upon that class of fastening shown and described in United States patent No. 222,400, December 9, 1879. In that patent the bifurcated or jaw-like spring or fastening is attached to and located above the usual sheet-metal eye-piece commonly employed to hook over the stud of the other half of the corset-steels.

In practice it has been found that the head of the stud, after the steels are fastened together, sometimes works under the ends of the spring or fastening part, and passes into the large part of the eye, and so, also, it sometimes happens that the spring-fastening is struck by the stud when entering the steel through the eye, thus bending it upward from the eye-piece, so that it will not again resume its proper level to correctly co-operate with the stud. To obviate these difficulties I have arranged at the under side of the eye-piece the spring or fastening which acts as a holder or stop to prevent the shank of the stud working backward along the slot of the eye-piece, and with such construction it will be obvious that the head of the stud, after the steels are fastened and the stud is at the extreme outer end of the slot in the eye-piece, cannot get between the spring-fastening and the eye-piece.

(Here follows diagram marked p. 426.)

Figure 1 represents a pair of corset-steels provided with my improved fastening, the steels being fastened together as they will be when the corset is being worn. Fig. 2 is an enlarged top view of one of the eye pieces or plates with its attached spring or fastening device. Fig. 3 is an under-side view of Fig. 2; Fig. 4, a top view of the eye-pieces with the spring or fastening device detached; and Fig. 5 is a section on the line *x x*, Fig. 1.

In the drawings, *a b* represent two steels of usual construction, the steel *b* being provided with the usual headed studs *c*. The steel *a*, at or near its central part, has two eye pieces or plates, *d*, of usual

(No Model.)

T. C. BATES.

Corset Steel Fastening.

No. 236,663. Patented Jan. 18, 1881.

No. 289.
U.S. Fastener Co.
v.
Kratzer.
} p. 426.

Fig: 1.

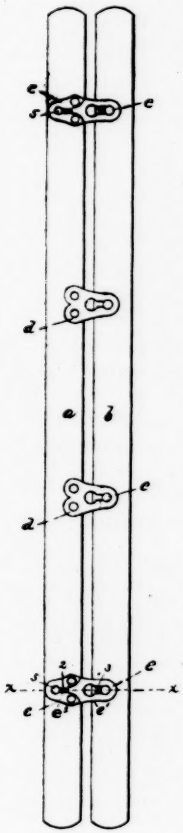
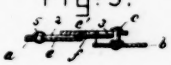


Fig: 2.

Fig: 3.

Fig: 4.

Fig: 5.



WITNESSES -
P. D. Dearborn.
L. F. Connor.

INVENTOR -
Theodore C. Bates
by Crosby & Gregory Attys.

construction, and at the top and bottom of the said steel are two eye pieces or plates, *e*, constructed in accordance with the plan adopted by me in this invention. This eye-piece *e* has an enlarged eye, with a straight slot leading outward therefrom, both of usual shape. The outward end of the eye-piece *e*, or that through which the eye is formed, is struck up in a die and raised or offset, as designated at e', and is also provided with an opening or recess, e^2, (shown clearly in Fig. 4.) to receive the rear end, 2, of the spring or fastening device *f*, (herein illustrated as a wire spring,) shaped as shown in Fig. 3, the free ends 3 of the said spring being so located with relation to the eye or slot in the eye-piece *e* as to fall at the rear side of the stud *c* when the corset-steels are fastened together as they will be when being worn.

In the act of fastening the two parts of the steel together the head of the stud will first be entered in the large part of the eye nearest the edge of the steel with which the eye-piece is connected, and the stud will then be passed horizontally along, and to the outer end of the said slot, passing the ends or end of the said spring or fastening device, the latter yielding to the passage of the stud, and then springing back laterally across the said slot, when it acts as a stop to prevent the backward movement of the stud *c* into the eye at the end of the said slot. This spring or fastening (see Figs. 1 and 2) is located at the under side of the eye-piece e', so that when entering the stud through the eye of the eye-piece the spring or fastening cannot be struck and bent upward, and as the head of the stud always rests upon the smooth upper side of the eye-piece when the corset is fastened about the person the said stud cannot possibly get between the spring or fastening and the eye-piece *e*, and so work backward along the eye of the eye-piece. The end 2 of the spring or fastening device entered into the opening e^2 of the eye-piece is prevented from turning upon the said eye-piece, and is held fixed to the steel by the rivet 5.

It is obvious, instead of the wire-like spring or fastening device herein shown having two jaws, that I may employ a single jaw. I prefer the wire spring, yet may employ instead of it a fastening of sheet metal, shaped substantially as shown in United States patent No. 225,375, March 9, 1880, to which reference may be had, the said spring or fastening device being located, however, in all instances at the under side of the eye-piece.

428 & 429

It may be found desirable to have all the eye-pieces on the clasps with this same spring attachment, even to the four usually used, or even more than four hooks, as a five-hook corset-steel is quite common.

I claim—

1. In a corset-steel, the eye-piece upon one steel and the stud upon the other steel, combined with a spring or fastening device located at the under side of the eye-piece, to operate upon the shank of the headed stud below the eye-piece, substantially as described.

2. The corset-steel *a* and its connected eye-piece *e*, provided with the raised or offset portion e' and slot e^2, and the spring or fastening device located thereon at its under side and connected with the said steel, combined with the steel *b*, provided with the headed stud *c*, to operate all substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THEODORE C. BATES.

Witnesses:
H. H. FAIRBANKS.
CHESTER W. DELVEY.

(No Model.)

L. GOULDING.

SPRING BUTTON.

No. 252,311. Patented Jan. 17, 1882.

Fig. 1.

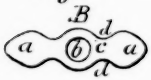


Fig. 3.

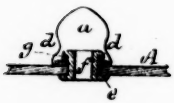


Fig. 2.

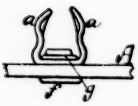


Fig. 4.

Fig. 5.

No. 289.
D. & A. Fastener Co. } p. 430.
v. Krautzer.

Witnesses.
H. C. Hodge
S. L. Simpson.

Inventor.
Lewis Goulding.
J. Curtis. Atty.

431 UNITED STATES PATENT OFFICE.

LEWIS GOULDING, of South Abington, Massachusetts, assignor to himself and Charles E. Phillips, of same place.

Spring-button.

Specification forming part of Letters Patent No. 252,311, dated January 17, 1882. Application filed October 29, 1881. (No model.)

To all whom it may concern:

Be it known that I, Lewis Goulding, a citizen of the United States, residing at South Abington, in the county of Plymouth and State of Massachusetts, have invented certain new and useful improvements in spring-buttons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to "spring buttons," so called, of the class in which the head is elastic to yield to the pressure of the button-hole while passing through the latter, and afterward expands to afford greater security against unbuttoning, my invention consisting in the peculiar manner of forming the button and attaching it to the material or base, and also in the peculiar construction of the button-hole, all of which will be hereinafter explained.

(Here follows diagram marked p. 430.)

The drawings which accompany this specification represent, in figure 1, a plan of the blank or planchet from which the button is formed. Fig. 2 is a side view, and Fig. 3 a section of the button secured to the material or base. Fig. 4 is a plan of the button. Fig. 5 is a section of the button and the material in which it is formed.

By referring to the above-named drawings it will be seen that A represents a piece of material to which the button is secured, whether one side of a coat, boot, glove, or other article of clothing, or the side of a traveling-carriage, &c.

In carrying my improvement into practice I punch from a sheet of thin spring metal a blank or planchet, B, of the shape shown in Fig. 1 of the drawings—that is, as having twin conical or tapering ends *a a* and a central hole, *b*, the metal being cut away upon each side between the central portion, *c*, of the planchet, in which the hole is formed, and each end or head *a a*, as shown at *d*, in order, when the sides of the planchet are folded, to constitute a contracted neck to the completed button, as shown in Figs. 2 and 3 of the drawings. The ends of the planchet thus formed are next bent at right angles to its central portion or base, *c*, and the button itself is complete,

the two sides *a a* of which conjointly constitute an elastic or yielding head, while the concave nick or depression *d* serves to form a contracted neck to such button, to enter the button-hole and effectually prevent unbuttoning of the two parts of the garment or other object.

To secure the button to the material A, I punch a hole, *e*, in the latter at the proper point, and I place the button upon the material with its orifice *b* coinciding with the hole *e* and firmly bind the two together by means of a long-necked eyelet, *f*, which I insert in the conjoint holes *b* and *e* from the inside of the material A, and finally upset or spread the eyelet down upon the inside of the base or central portion of the button, as shown in Fig. 3 of the drawings. For greater security I create upon the base *c* of the button, and about its orifice or hole *b*, an annular concentric ledge, *g*, over which the end of the eyelet is spread, as shown in said Fig. 4.

To provide a button-hole to operate with this button, I employ an eyelet, *i*, fastened in the ordinary manner within a hole, *j*, punched in the opposite portion, C, of the garment or other object, this eyelet being of such size as to crowd over the head of the button with sufficient pressure to compress or contract its sides *a a*, which afterward expand and retain the eyelet firmly and securely about the neck portion *d* of such button.

In the usual manner of setting an ordinary eyelet the end which is upset or turned over becomes cracked invariably, and retains much less secure hold upon the material than its head, which remains intact, and in addition to this its split side is liable to cut its way through the material. To counteract this tendency I employ, in addition to the eyelet *i*, a washer, *k*, which I place over the neck of such eyelet and upon the material, after the neck of the eyelet has been inserted in such material, and finally spread the end of the eyelet down upon or over the washer, as shown in Fig. 5 of the drawings. In order that the washer *k* last named may take a firm hold upon the material C, I form upon its under or inner side an annular lip, *l*, which sinks into the material when the eyelet is set.

432 & 433 A button formed and applied as above explained is strong and durable, easily buttoned and unbuttoned, and retains firm and permanent hold upon the material.

For covered land-carriages the body of the button is to be secured rigidly to the side or back of the carriage-body, while the metallic button-hole above described is to be formed in edges of the curtains or sides of the covering of the carriage.

I claim—

1. A button consisting of a perforated base and two spring-metal ears, in combination with an eyelet which is adapted to pass through a fabric and through said perforated base, for the purpose of fastening the button to the fabric, substantially as set forth.

2. A button consisting of a perforated base and two spring-metal ears, in combination with an eyelet which is adapted to pass through

said perforated base, an eyelet, *i*, adapted to engage with said button, and a washer, *k*, having one or more corrugations, and inserted between one of the flanges of said eyelet and the fabric to which it is attached.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS GOULDING.

Witnesses:
GEORGE B. PUY.
F. CURTIS.

435 UNITED STATES PATENT OFFICE.

WILLARD M. WILLIAMS, of Boston, Massachusetts, assignor to Edward J. Kraetzer, of same place.

Glove-fastener.

Specification forming part of Letters Patent No. 331,266, dated November 24, 1885. Application filed May 21, 1885. Serial No., 166,306. (No model.)

To all whom it may concern:

Be it known that I, Willard M. Williams, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful improvement in glove-fasteners, of which the following is a specification.

The object of my invention is to provide a cheap, simple, convenient, and durable fastening for gloves and other articles of wearing-apparel; and it consists in the novel construction, combination, and arrangement of the several parts of the device, as hereinafter more fully described, and specifically set forth in the claim.

This invention relates to that class of fastenings known as "separable buttons."

(Here follows diagram marked p. 434.)

Figure 1 represents a vertical longitudinal sectional elevation of a fastener constructed in accordance with my invention as attached in use. Fig. 2 represents a vertical section of the shell or case adapted to receive the operative devices. Fig. 3 represents a horizontal sectional elevation showing the spring in position within the shell, drawn on an enlarged scale. Fig. 4 represents a vertical section through the two eyelets in position to be inclosed in the shell. Fig. 5 represents a sectional elevation of the stud attached to a piece of material.

A represents the shell or cap, formed of thin sheet metal, and having an annular shoulder, B, upon which the flange C of the eyelet E rests when it is placed in position within the said cap or shell A, as shown, the S-shaped spring H being placed within the horizontal slot L, formed in one side of the eyelet E, so as to be retained in position and held within the said shell, as shown in Fig. 3. Then the eyelet F is placed upon the eyelet E with its flange G resting upon the flange C of the eyelet, and then the edge of the cap or shell A is turned inwardly and pressed down on the flange G of the eyelet, and thus secures the parts firmly in position, leaving the end of the eyelet F projecting a short distance. A suitable hole being formed through the glove-wrist or other desired material, the end of the said eyelet F is inserted through the same. Then a suitable metal washer, K, is passed over the end of the said eyelet, and the end of the eyelet turned over and down upon the washer, thereby securing this portion, or half, or part of the fastener or button permanently in position, as shown. Now, I provide a stud, P, having a thin flat head, R, and the opposite end, S, formed conical or oval, and provided with an annular groove, T, adapted to engage with

(No Model.)

W. M. WILLIAMS.

GLOVE FASTENER.

No. 331,266. Patented Nov. 24, 1885.

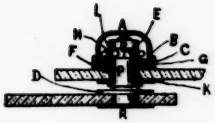


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

No. 289.
B. & S. Fastener Co. } p. 434.
v. Kraitzer

WITNESSES:
Chas. S. Gooding.
W. R. Marble.

INVENTOR:
Willard M. Williams.
per. Sylvenus Walker
Attorney

the central portion of the said spring H, as shown in Fig. 1, when the end S of the said stud P is passed into the said eyelets E and F until it contacts with the body or central portion of the said S-shaped spring, which passes through or within the said slot L, as shown in Fig. 3. A slight pressure upon the stud forces the said body portion of the spring outward within the said slot, thereby compressing the return end of the spring which is outside of the eyelet opposite the said slot until the end of the said stud passes inwardly beyond the spring, which returns to its normal position within the said slot and resting within the said annular groove T of the stud, as shown, thereby connecting the parts together. The said stud P is secured to the opposite side portion of the opening at the wrist of a glove or other desired position by forming a hole or opening and inserting the stud P therein; then place the washer D over the stud and press it downward upon the enlarged portion near the head, when, by means of a suitable tool or instrument, the shoulder or step is upset or clinched down upon the said washer, so as to securely attach the said stud portion to the fabric, as heretofore employed. It will be seen that the said wire spring H is of a peculiar shape and of very simple formation, which renders it very durable and cheap to make, and when inserted within the shell, as shown, it is less liable to become accidentally disengaged from the annular groove of the stud than those heretofore constructed. As its opposite ends are so arranged as to have a bearing at opposite sides of the said shell or cap, it is more uniformly acted upon by the insertion of the stud in connecting the two opposite portions, as above described.

By constructing the two short tubular eyelets, E and F, with their flanges C and G placed together and both held in position by the inward-turned edge of the cap or shell A, common eyelets may be employed, only requiring the formation of the horizontal slot L in the side of the inclosed one, rendering this portion of the fastening very cheap and simple. It will be seen that by means of the said annular shoulder B the said eyelet E is suspended within the said shell or cap A by means of its flange C, and that no other portion of the eyelet comes in contact therewith, thereby simplifying said shell or cap in its construction and rendering this half or separable portion of the fastening or button more desirable, as a less depth of shell is required, and the face or top of the shell or cap A is without a central opening, thus permitting the same to have a neat and finished surface.

436 & 437

Having thus described my invention, what I claim is—

A glove-fastener consisting of the shell or cap A, having an annular shoulder, B, and provided with the inclosed eyelet E, having a flange, C, resting upon said shoulder and provided with a slot, L, and the S-shaped spring H, having its central portion resting in said slot, and the eyelet F, provided with a flange, G, bearing upon the said flange C and secured to said shell, as described, all being constructed and arranged for operation with the stud P, substantially as shown and described.

WILLARD M. WILLIAMS.

Witnesses:

SYLVENUS WALKER.

CHAS. L. GOODING.

439 UNITED STATES PATENT OFFICE.

EDWIN J. KRAETZER, of Boston, Massachusetts.

Fastener for Gloves, &c.

Specification forming part of Letters Patent No. 281,376, dated July 17, 1883. Application filed March 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, Edwin J. Kraetzer, of Boston, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful improvement in fasteners, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

(Here follows diagram marked p. 438.)

Figure 1 is an isometrical perspective view representing my improved fastener detached; Fig. 2, a view representing it in use on a glove; Fig. 3, a view representing it in use on a shoe, and Fig. 4 a view representing it in use on a cloak.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to that class of fasteners or buttons which are designed for fastening or buttoning gloves, shoes, cloaks, &c.; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more effective and desirable article of this character is produced than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation, its extreme simplicity rendering an elaborate description unnecessary.

In the drawings, A represents the button proper, and B the catch proper.

The button proper consists of the globe or ball *x*, shank or neck *a*, and plate C. The shank *a* is composed of a short wire which is rigidly attached at its outer end to the globe *x*, and at its inner end to the plate C, being preferably inclined to the plane of said plate at an angle of about fifteen degrees.

The catch proper consists of the plate D, globes or balls *m m*, and shanks or necks *d d*. The shanks *d d* are composed of short elastic wires or springs, their outer ends being respectively rigidly attached to the globes *m m*, and their inner ends to the plate D, the shanks being preferably inclined to the plane of the plate D at an angle of about sixty degrees. The shanks *d d* are also preferably so arranged

(No Model.)

E. J. KRAETZER.

FASTENER FOR GLOVES, &c.

No. 281,376. Patented July 17, 1883.

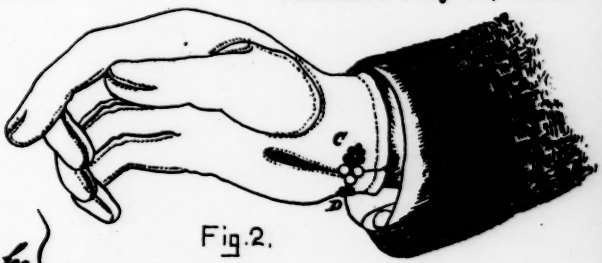


Fig. 2.

No. 289.
B'k's Fastener Co.
v.
Kraetzer.
p. 438.

Fig. 1.

Fig. 3.

Fig. 4.

Witnesses.
H. C. Kennick
L. J. White.

Inventor.
Edwin J. Kraetzer,
per C. A. Shaw.
Atty.

on their plate as to cause the globes *m m* to press forcibly against each other.

In the use of my improvement the plate D is secured or attached to one flap or side of the glove, and the plate C to the other, as shown in Fig. 2, and to button the glove the ball or globe *x* of the button proper is drawn over or past the globes or balls *m m*, and pushed down or inwardly, causing the neck or shank *a* to force the globes *m m* apart and pass between them; the globe *x* being then released, and the "spring" or contractile action of the glove drawing it partially under the globes *m m* and against the shanks *d d*, by which it will be caught and held in a manner which will be readily obvious without a more explicit description.

It will also be obvious that in buttoning the glove, when the center of the ball *x* has passed a vertical line drawn through the centers of the balls *m*, the convex surfaces of all three balls being in contact, if the ball *x* is pressed down or inwardly, it will slide down or in over the sides of the balls *m m*, which are next to the plate D, and at the same time draw the plate C and the flap or part of the glove to which it is attached toward the plate D, and that when the center of the ball *x*, as it is pushed down or inwardly, has passed a horizontal line drawn through the centers of the balls *m m*, it will, if released, cease to traverse toward the plate D, and be drawn partially under the balls *m m*, where it will engage and be held by the shanks *d d*, the neck *a* being prevented from accidentally escaping from between the balls *m m* by the shanks *d d*, which hold said balls forcibly together, the shanks yielding to permit the neck *a* to pass in or out between them in buttoning or unbuttoning the glove.

The plates C D may be made of any desired style or shape, and concealed or covered in the flaps of the glove or other article to which they are applied; or they may be secured to the outside of the same, as preferred, by means of stitches or rivets passing through the holes *f*, or in any other suitable manner.

440 & 441 It is preferable to construct the balls or globes *m x* of metal, and perfectly round and smooth, but other materials may be used, if desired, and the balls may be somewhat angular and still perform the same functions.

A short chain or cord may also be used instead of the wire neck *a*, and either or both of the plates C D may be attached to rubber bands or elastics to permit them to yield in buttoning the glove, and assist in keeping the parts interlocked, if desired, although, for all ordinary purposes, it will be found sufficient to attach the plates directly to the flaps or contiguous ends or sides of the glove or other article to be fastened.

It will be evident that my improved fastener obviates the necessity of using button-holes, and that it is well adapted for gloves, shoes, belts, garters, suspenders, cloaks, and in fact nearly all kinds of garments.

I do not confine myself to so constructing or arranging the spring-shanks *d d* that they will force the balls *m m* into actual contact, as it will be evident that if they are kept sufficiently near each other to prevent the accidental escape of the neck *a* it will be all that

is required. Neither do I confine myself strictly to the use of the plates C D, as the spring-shanks *d d* may be made integral or in one piece, and enlarged at their outer ends to grasp the ball *x*, if desired. The inner end of the neck *a* may also be provided with an eye or hook for attaching it to the garment, instead of the plate C, the neck and ball *x* being made integral, if desired, said last-named plate being also dispensed with when a cord or chain is used instead of the neck *a*.

Having thus explained my invention, what I claim is—

1. The improved fastener described, the same consisting of the plate D, provided with the spring-shanks *d d* and balls *m m*, and the plate C, provided with the neck *a* and ball *x*, arranged to operate substantially as set forth.

2. In a fastener, substantially such as described, a catch proper having two spring-shanks enlarged or terminating in balls at their outer ends, said spring-shanks acting to force the balls or enlarged portions toward each other or into contact, and adapted to be attached to a glove or other article of wearing-apparel, and a button proper having a ball provided with a neck or means for attaching it to a glove or other article of wearing-apparel, said neck being adapted to pass between the balls or enlarged ends of said spring-shanks, and thereby enable the button proper and catch proper to be interlocked, substantially as specified.

EDWIN J. KRAETZER.

Witnesses:
C. A. SHAW.
L. J. WHITE.

(No Model.)

E. J. KRAETZER.

GLOVE FASTENER.

No. 290,067. Patented Dec. 11, 1883.

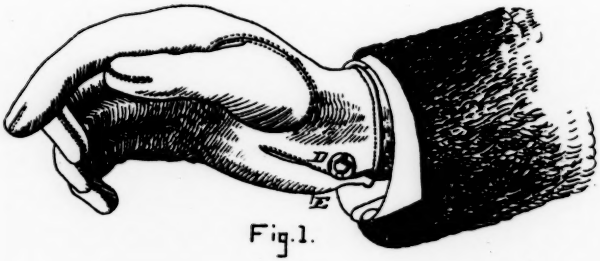


Fig. 1.

No. 289.
Bds. Fastener Co. } p. 442.
v.
Kraetzer.

Fig. 2.

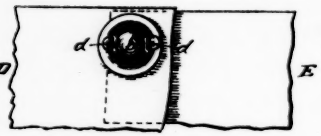


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Witnesses.
H. C. Wemick.
L. J. White.

Inventor.
Edwin J. Kraetzer,
Per C. C. Shaw.
Atty.

443 UNITED STATES PATENT OFFICE.

EDWIN J. KRAETZER, of Boston, Massachusetts.

Glove-fastener.

Specification forming part of Letters Patent No. 290,067, dated December 11, 1883. Application filed September 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, Edwin J. Kraetzer, of Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful improvement in glove-fasteners, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

(Here follows diagram marked p. 442.)

Figure 1 is a perspective view, representing my improved fastener in use; Fig. 2, a vertical transverse section; Fig. 3, a top plan view; Fig. 4, a perspective view of the lower portion of the eyelet; Fig. 5, a like view of the upper portion of the eyelet, and Fig. 6 a perspective view of the catch.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to a fastener designed for fastening gloves, shoes, cloaks, coats, vests, and other garments; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a cheaper and more effective device of this character is produced than is now in ordinary use.

In the drawings, A represents the lower portion of the eyelet, B the upper portion, and C the catch.

The lower portion, A, consists of a thin metallic ring, *x*, provided with an upwardly-projecting and outwardly-inclined ear, *d*, at either side of its central opening, *m*.

The upper portion, B, consists of a thin metallic ring, *v*, preferably corresponding in size with the ring *x*, and provided at either side of its central opening with a downwardly-projecting and inwardly-inclined curved elastic flange, *i*, this portion of the eyelet being represented as reversed or upside down in Fig. 5 of the drawing, to more fully show the flanges.

The catch C consists of a small ball, *f*, plate *g*, neck or shank *l*, plate *n*, and stud *r*. The ball *f* and plate *g* are connected by the neck *l*, which is preferably inclined, as best seen in Fig. 2. The stud *r* has one of its ends soldered or brazed to the plate *n*, its opposite end being fitted into and passing slightly through a hole in the

plate *g*, where it is secured, when the catch is attached to the glove or other article with which it is used, by heading or upsetting its protruding end *z*. If preferred, the stud may be brazed to the plate *g*, and the plate *n* furnished with a hole to receive its opposite end, in which it may be secured by being headed or upset, as described. The stud *r* may also be made integral with the plate *n* or *g*, if desired.

In attaching the eyelet to the glove, a hole is first made near the edge of the flap D, of sufficient size to receive the elastic curved flanges *i*. The ring *v* is then placed on the flap with its flanges projecting downwardly through the hole, one of the spaces *t* being arranged on the side next the flap E, after which the ring *x* is placed under the flap immediately beneath the ring *v*, and in such a position that its locking-ears *d* will project upwardly between the flanges *i* through the spaces *t*. The ends of the ears *d* are then clinched or bent down over the ring *v*, as best seen in Fig. 3, thereby securely attaching both portions of the eyelet to the glove. The central opening, *m*, in the ring *x* is slightly larger than that in the ring *v*, so that when the flanges *i* are in position for use they can be expanded sufficiently in the opening *m* to receive the ball *f* without being interfered with by the ring *x*.

In attaching the catch C to the glove, a small hole or perforation is made near the edge of the flap E, in which the stud *r* is inserted from the under side of said flap. The stud is then passed through the hole in the plate *g*, and its protruding end headed or upset, thereby securely fastening the catch to the flap, the neck of the catch being preferably arranged to incline toward the flap D, as seen in Fig. 2.

In the use of my improved fastener, the flanges *i* are forced downwardly over the ball *f*, thereby expanding or springing them outwardly as the ball passes between them, the neck *3* of the catch resting in one of the spaces *t*. After the ball has entered the eyelet, the flanges contract below its center, and thus hold in its place or retain it in the eyelet in a manner which will be readily obvious without a more explicit description. The distance between the outer ends of the flanges *i* is less than the diameter of the ball *f*, thereby rendering it necessary to exert a slight amount of force to insert the ball in the eyelet and interlock the two sections of the fastener, and also a like amount of force to disconnect the sections.

444 & 445

It will be understood that the strain is not entirely on the flanges *i* when the glove is fastened, but mostly on the ring *v*, the principal office of the flanges being to retain the ball in the eyelet through which it protrudes, as seen in Figs. 1 and 2, the holes in the eyelet-plates being sufficiently large to permit the ball to be passed through them.

I prefer to incline the shank *l* slightly toward the flap D, as shown in Fig. 2; but it may be arranged vertically or may incline in the opposite direction, if desired.

The flanges *i* are formed integral with the ring *v* and the flanges *d* with the ring *x*, but may be made separately, if preferred.

I hereby reserve the right to obtain a separate patent on a subsequent application for the eyelet herein shown and described.

Having thus explained my invention, what I claim is—

1. A catch for glove, boot, or garment fasteners, consisting of an inner and an outer plate, a stud connecting said plates, and a shank attached to the outer plate provided with a ball, substantially as described.

2. The combination of a catch consisting of an inner and an outer plate, a stud connecting said plates, and a shank attached to the outer plate provided with a ball, and a spring-flanged eyelet adapted to receive the ball of said catch, substantially as described.

3. The combination of an eyelet consisting of a flat ring for the inner side of the glove, boot, or garment, provided with ears at its inner edge, and a ring for the outer side of the garment, provided at its inner edge with inwardly-inclined spring-flanges, the ears of the inner ring being adapted to pass through the spaces between the flanges of the outer ring and fold down on the latter, and a catch consisting of an inner plate provided with a stud, and an outer plate adapted to turn on said stud, provided with a projecting shank at its outer edge, having a ball, substantially as described.

EDWIN J. KRAETZER.

Witnesses:
C. A. SHAW.
L. J. WHITE.

447 UNITED STATES PATENT OFFICE.

EDWIN JENNISON KRAETZER, of Boston, Massachusetts.

Glove-fastener.

Specification forming part of Letters Patent No. 306,021, dated September 30, 1884. Application filed July 31, 1884. (No model.)

To all whom it may concern:

Be it known that I, Edwin Jennison Kraetzer, of Boston, in the county of Suffolk, of the Commonwealth of Massachusetts, have invented a new and useful improvement in fastenings for the wrists of gloves, or for parts of various other articles; and I do hereby declare the same to be described in the following specification, and represented in the accompanying drawings, of which—

(Here follows diagram marked p. 446.)

Figure 1 is a transverse section of a glove-fastener of my improved kind, as applied to the two separate portions of a glove-wrist. Fig. 2 is a transverse section of the hood and flanged ring to be described. Fig. 3 is a top view of the said flanged ring. Figs. 4 and 5 are transverse sections of such flanged ring, one section being taken in a plane at right angles to that of the other. Fig. 6 is an under side view of the eared ring of the hood. Figs. 7 and 8 are transverse sections of such eared ring and its hood, to be described. Fig. 9 is an under side view of the upper lap of a glove-wrist, with the two rings applied to it. Fig. 10 is a top view of the lower lap, with the stud or knob applied thereto, such stud or knob being to enter the elastic jaws of the hood. Fig. 11 is a view of the wrist portion of a glove, as having its laps connected by my improved fastening. Fig. 12 shows in transverse section the hood as made with the ears projecting directly from its base, instead of from a separate ring encompassed by and fixed to the said base.

The nature of my invention is defined in the claims hereinafter presented, the fastening embodying it being composed not only of two disks and a stud or knob having its shank extended through them and upset at its end upon one of them, but of a hood provided with ears extending from its base at opposite sides of the inner periphery thereof, and of a ring having at each of its two opposite sides of its inner periphery a flange, the two flanges being separated by two intervals or spaces between them at their ends, as represented. The said hood is shown as composed not only of a ring having two ears projecting downward from its lower surface at opposite parts of its inner periphery, but of a separate cap extending above the ring and embracing it on the periphery of its base and two opposite sides of such base, all being as represented.

(No Model.)

E. J. KRAETZER.

GLOVE FASTENER.

No. 306,021. Patented Sept. 30, 1884.

No. 289
B. & S. Fastener Co. } p. 446
v.
Kraetzer.

Fig 11

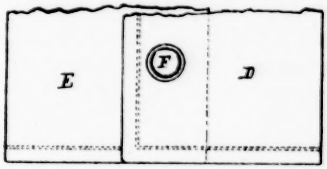


Fig 7.

Fig 1

Fig 2

Fig 6

Fig 4

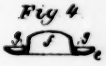


Fig 9

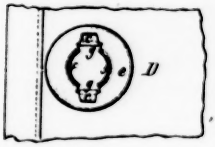


Fig 8

Fig 3.

Fig 12

Fig 10

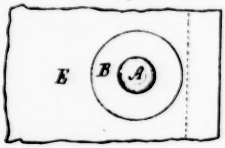


Fig 5.

Witnesses.
L. N. Pipes
E. R. Pratt

Inventor
Edwin Jennison Kraetzer
by R. K. Sey atty

The hood, however, may be made without the ring, but with the ears extending directly from the base of such hood.

In the drawings, A denotes the knob, and B and C the two disks with which it is connected. The shank *a* of the knob has a shoulder, *b*, against which the upper disk bears when it is on the upper side of the lower of the two laps D E, or parts of a glove or other article to be secured together by the fastening. The shank goes through the two disks B and C and the lap directly between them, and at its lower end such shank is upset or riveted upon the lower disk. By such means the knob is secured to the lap.

The hood is shown at F as provided with the two projections or ears *c c*, arranged and extending down from it or its ring *d*, as shown in Figs. 6, 7, and 8. The flanged ring is exhibited in Figs. 1, 2, 3, 4, 5, and 9 as consisting of a flat or concavo-convex ring, *e*, and two flanges, *f f*, such flanges projecting upward from the ring at opposite sides of its inner periphery, there being intervals or spaces *g g* between the two flanges at their opposite ends. These flanges are to operate as elastic jaws to slip over the head of the knob and to give way to allow it to pass between, and afterward by contracting to embrace it, so as to hold it between them in a manner to prevent it from accidentally separating from them.

The hood F is to be placed with its base on the upper surface of the lap D, and with the two ears *c c* extending down through a circular hole in the lap, such hole having a diameter sufficient to enable it to receive, in manner as shown in Fig. 1, the knob A and the two elastic flanges *f f*. Next, the ring *e* is to be placed against the lower surface of the lap D in a manner to have the said flanges extended upward into the hood, and with the two ears *c c* of the latter going down through the spaces *g g* between such flanges, after which the two ears are to be bent outwardly from each other and closely down upon the lower surface of the ring, the ears so bent down being shown in Figs. 2 and 9.

To engage the lap D with the lap E, the hood, with its
448 & 449 elastic jaws or flanges, is to be forced down over and upon the knob, so as to cause its head to pass between and above the jaws and flanges, they, by their inherent elasticity, springing apart and afterward in toward each other and the shank of the knob, so as to hold the knob in engagement with the hood to prevent their accidental separation. By pulling upward the lap D the hood can be separated from the knob.

The hood serves to protect and cover the knob, not only to prevent it from being accidentally forced down through and out of the jaws, but prevents extraneous matters from getting between the knob and the jaws.

I do not herein claim a fastening device consisting of a socket-piece formed of sheet metal, with an arm and elastic jaws extending from it and integral with it, and also of a knob and a circular plate extending from the knob-shank, all being as represented in the United States patent No. 276,714; nor do I herein claim for a glove or garment fastener an eyelet consisting not only of a ring provided with ears extending from it at its inner periphery, but of

another ring having at each of the two opposite sides of its inner periphery a flange, such being as represented in the United States patent No. 290,067, dated December 11, 1883, and granted to me.

I do not claim a glove-fastening constructed as represented in the British patent No. 1450, of the year 1870, there being important differences between the said fastening and that hereinbefore described. While I have, like the said patented fastening, a knob and a perforated jawed plate and a hood to the latter, I have the parts made and applied differently. My hood instead of having a cylindrical projection to screw into a similar one extending upward from the jawed plate and to go through the glove material to which the hood and plate are to be applied, has two ears extending downward from its base, and the ring to couple with it has two elastic flanges, and between them two notches to receive the ears, which, after insertion in the notches, are bent upon the ring so as to connect it to the hood and the glove material between the two. Furthermore, instead of the knob being fixed to and extended from a single plate held to the material by rivets, I have the knob separate from the support-plates, and provided with a shank that goes through them and the material between them, and is upset upon the lower one, my modifications allowing the fastening to be made not only much cheaper, but better in several respects, especially in the matter of the hood, whose fastening-ears extend from the inner periphery of a ring arranged within the hood, and constituting a broad base or plate to rest on the material of the glove. In my fastening the extreme edge of the hood is insulated from the material, or does not bear directly on it to cut into it when the hood is fixed to the jawed plate. There are also essential differences between my glove-fastening and that represented in the British patent No. 809 for 1877, for the latter has a "split ring" without jaws, while I have an entire ring with elastic jaws, with notches or spaces between them to receive the ears of the hood, and, furthermore, the hood of my glove-fastening has its ears projecting from a flat ring embraced by the hood, which is not the case with the fastening of said British patent.

I claim—

1. In a glove-fastening, the combination of the hood provided with two ears extending downward from its annular base at opposite sides of the inner periphery thereof, with a ring having at each of the two opposite sides of its inner periphery an elastic flange or jaw, the said ears being depressed between the said elastic flanges or jaws and bent outwardly and against the under surface of their ring, so as to couple the two together and upon a glove-lap or piece of cloth or material when between them, all being substantially as set forth.

2. In a glove-fastening, the combination of the entire ring provided with elastic flanges or jaws arranged and extending from it as described, with another ring having ears going between the jaws at their ends and bent down upon the first-named ring, and with a separate hood encompassing the other or eared ring at its base and

embracing opposite sides of the latter, all being substantially as represented.

3. The combination of the two disks B and C and a knob, A, having its shank extended through them and upset at its end against the lower of them, with an entire ring provided with two elastic flanges or jaws, another ring having two ears extending from it between such jaws and bent down upon the first-named ring, and a separate hood provided with two ears extending from its base at opposite sides of the inner periphery thereof, such ears going through the flanged wing between its two jaws or flanges, and being bent down against it, as represented.

4. The combination of the two disks B and C and a knob, A, having its shank extended through them and upset at its end against the lower of them, with an entire ring provided with two elastic flanges or jaws, and with a separate hood having two ears extending from its base-ring, as described, and between the said flanges or jaws, and bent against the ring, all being substantially as set forth.

EDWIN JENNISON KRAETZER.

Witnesses:
R. H. EDDY.
E. B. PRATT.

451 UNITED STATES PATENT OFFICE.

EDWIN J. KRAETZER, of Boston, Massachusetts.

Glove-fastener.

Specification forming part of Letters Patent No. 359,614, dated March 22, 1887. Application filed October 27, 1886. Serial No. 217,369. (No model.)

To all whom it may concern:

Be it known that I, Edward J. Kraetzer, of Boston, in the county of Suffolk and State of Massachusetts, have invented an improvement in glove-fasteners, of which the following is a specification.

The object of my invention is to provide a cheap, simple, convenient, and durable glove-fastener, which may be quickly applied to the wrist portions of a glove by machinery; and it consists in the novel construction, combination, and arrangement of the several parts of the fastener, as hereinafter more fully described, and set forth in the claims.

(Here follows diagram marked p. 450.)

Figure 1 represents a transverse central section of a glove-fastener constructed according to my invention, showing the same in position for securing the opposite portions of the wrist of a glove together. Fig. 2 represents a similar view of the spring-cap part or portion disconnected. Fig. 3 represents a similar view of the stud portion disconnected. Fig. 4 represents a side elevation of the top cap before being united or connected. Fig. 5 represents a side elevation of the interior spring-shell before being united. Fig. 6 represents a perspective view of the spring-ring before being inclosed in the shell. Fig. 7 represents a perspective view of the inclosing-cap before connection with the shell. Fig. 8 represents a side elevation of the stud. Fig. 9 represents a side elevation of the rivet.

A represents the portions of a glove or other article of wearing-apparel to which the fastener is intended to be applied so as to temporarily connect the opposite portions together, as heretofore employed for the purpose, and consisting of two main portions, a stud and spring-cap.

The stud D is composed of two parts. The outer one, D, is constructed like an eyelet, or tubular, having a projecting head or flange, C, from the center of which projects the hollow or tubular stud portion D, the upper or terminating end portion of which is made convex, or with a semi-spherical form, and is provided with an annular groove or neck, *a*. The extreme point of the terminating end portion, *b*, is left open, so as to admit the insertion of a proper instrument therein in order to head or upset the hollow interior rivet, E, so as to permanently secure the stud portion to the part of the glove A, or other article, as shown. The said hollow

(No Model.)

E. J. KRAETZER.

GLOVE FASTENER.

No. 359,614. Patented Mar. 22, 1887.

Fig. 1.

Fig. 2.

Fig. 4.

Fig. 3.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

No. 289.
B. H. S. Fastener Co. v. Kraetzer. p. 450.

WITNESSES:
William H. Parry.
E. F. Emanuel

INVENTOR:
Edwin J. Kraetzer.
By Dyberry & Walker
Attorney

rivet E is formed similar to an eyelet, and is provided with a projecting head or flange, F, from the center of which projects the hollow portion E, adapted to fit snugly within the hollow tubular portion D of the said stud, and when it is desired to secure the stud in position on the wrist of a glove or other article a small hole is punched or cut therein and then the hollow rivet E is inserted in the hole, and then the tubular stud D is placed over the projecting end of the rivet, and then an instrument or punch is placed into the end of the stud bearing on the rivet, and then by a blow or pressure upon the same the end of the rivet is upset or riveted within the head portion of the stud, which is thereby firmly and quickly secured in place, the flange C of the stud bearing upon one side of the material A and the flange F of the rivet upon the opposite side thereof, as shown in Fig. 3. The material is compressed and tightly held or clamped between the said flanges.

The spring-cap is composed of four parts. The outer cap, B, is struck up from sheet metal and provided with a central hole or opening, *c*, the main or body portion being formed dome-shaped or somewhat semi-spherical, as shown in Fig. 4, or of any suitable ornamental design which may be desired.

The spring-case H, or chamber-shell inclosing the spring, is composed of a somewhat conical eyelet or shell having an enlarged opening at one end and provided with an interior annular shoulder, *e*, and connected by a semi-spherical portion, terminating in a contracted neck or tubular end portion adapted to fit closely within the opening or hole *c*, formed in the said outer cap, B, when secured together, as hereinafter described and as shown in Figs. 1 and 2.

A coiled-wire spring, G, is constructed of such interior opening or diameter as to properly fit the neck *a* of the said stud D when the opposite parts of the fastening are pressed together, as hereinafter described. The spring-ring G is placed within the said shell-case H, resting upon the shoulder *e* thereof concentric with the interior opening, but of such exterior diameter as to fit loosely within the largest end portion of the said shell-case H, so as to allow
452 & 453 the spring-ring G to be expanded when the head of the stud is forced or drawn through the same in operation, as hereinafter set forth. Now, this spring-ring G is secured or retained in relative position within the said shell H by means of the inclosing annular-flanged cap-piece K, which is provided with a central opening, *g*, which is a trifle larger than the diameter of the head of the stud to be inserted through the same in use. The vertical side portions of the said cap-piece K are of such interior diameter as to fit closely upon the exterior vertical largest end portion of said shell-case H when pressed together and finished, as shown, whereby the spring is inclosed and retained. Now, in order to secure this spring-cap portion of the fastener in position on the opposite side portion of the wrist of a glove or other article, a small hole is punched or cut therein and then the contracted neck or small tubular end portion of the said shell-case H is inserted through the hole formed, and then the outer cap, B, is placed with its hole *c* over the end or projecting portion of the shell-case H,

which is then turned outward and downward thereon and then clinched together, thus securing the parts with a firm bearing upon opposite sides of the said material A, which is clamped between said parts, as shown in Figs. 1 and 2.

Now, it will be seen and understood, when it is desired to connect the two main portions or sections B D of the fastener together temporarily, it is only necessary for the operator to place the former over the latter and press them lightly together. When the convex end portion of the stud passes through the spring-ring G, it slightly expands or opens it until the enlarged head end has passed through, when it contracts into the groove or neck *a*, and thus secures the parts together in such manner that any lateral strain brought to bear upon the opposite parts does not tend to displace or disconnect the sections B D of the fastening, but the same are readily and very easily disconnected by slight force applied in the line of the axis of the connecting stud portion; or drawing the parts concentrically from each other, or nearly so, when in use, they are instantly separated.

It will be seen that by means of this peculiar construction of the connecting parts B and D when in use the lateral strain brought to bear upon the opposite portions, tending to disconnect them, is effectually obviated, as the bearing is effected wholly upon the neck of the stud, which has a firm contact with the edge of the central opening, *g*, formed in the shell-cap K, thus relieving the spring from all pressure tending to weaken or destroy its action and efficiency.

Having thus described my invention, what I claim is—

A glove-fastener consisting of the outer cap, B, having an opening, *c*, the spring-case H, provided with an annular shoulder, *e*, and adapted to be secured to the said cap B, as described, the spring-ring G, inclosed within the said case H by means of the flanged cap-piece K, and a stud, D, as set forth.

EDWIN J. KRAETZER.

Witnesses:

SYLVENUS WALKER.

WILLIAM H. PARRY.

(No Model.)

E. J. KRAETZER.

GLOVE FASTENER.

No. 359,615. Patented Mar. 22, 1887.

No. 289.
B. V. S. Fastener Co. } p. 454
Kraetzer.

Fig. 1.

Fig. 5.

Fig. 2.

Fig. 11.

Fig. 12.

Fig. 6.

Fig. 3.

Fig. 13.

Fig. 7.

Fig. 4.

Fig. 14.

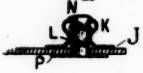


Fig. 8.

Fig. 10.

Fig. 15.

Fig. 9.

WITNESSES:
William A. Parry
E. F. Emanuel

INVENTOR:
Edwin J. Kraetzer
By Sylvenus Walker
Attorney

455 UNITED STATES PATENT OFFICE.

EDWIN J. KRAETZER, of Boston, Massachusetts.

Glove-fastener.

Specification forming part of Letters Patent No. 359,615, dated March 22, 1887. Application filed January 22, 1887. Serial No. 225,190. (No model.)

To all whom it may concern:

Be it known that I, Edwin J. Kraetzer, of Boston, in the county of Suffolk and State of Massachusetts, have invented an improvement in glove-fasteners, of which the following is a specification.

The object of my invention is to provide a cheap, simple, convenient, and durable glove-fastener, which may be secured to the opposite portions of the wrist of a glove or other article in a very expeditious manner, so as to form a neat and compact fastening, which may be connected and disconnected instantly when the glove is in use, and yet hold the parts together very firmly against any lateral strain tending to displace or disconnect the opposite portions; and it consists in the peculiar construction, combination, and arrangement of the several parts of the device, as hereinafter more fully described, and set forth in the claims.

(Here follows diagram marked p. 454.)

Figure 1 represents an elevation of the top cap disconnected from the other parts of the fastener. Fig. 2 represents a similar view of the interior spring shell or case as formed to receive the spring. Fig. 3 represents a plan of the spring-ring. Fig. 4 represents an elevation of the inclosing annular flanged spring-retainer. Fig. 5 represents a vertical section through the shell-case, spring-ring, and annular flanged spring-holder as connected together in position to be attached. Fig. 6 represents an elevation of the shell-stud. Fig. 7 represents an elevation of the hollow rivet. Fig. 8 represents a vertical section through the shell-stud and hollow rivet as secured in position. Fig. 9 represents a vertical section through the opposite portion of the fastener, consisting of the cap, spring-shell, spring, and flanged retainer secured in position. Fig. 10 represents a vertical section of a glove-fastener secured in position as embodying my invention. Fig. 11 represents an elevation of a cap and spring-shell combined disconnected from the other parts, showing a modification of Fig. 2. Fig. 12 represents a plan of the spring-ring. Fig. 13 represents an elevation of an attaching-eyelet disconnected from the other parts. Fig. 14 represents a plan view of a washer. Fig. 15 represents a vertical section showing a modification of one portion of the fastener connected to a portion of a glove-wrist or other article.

A represents the top shell or cap, formed of sheet metal, and provided with a central opening, B, surrounded by an annular depression or countersunk cavity, as shown in Figs. 9 and 10. The said opening B is adapted to receive the upper end, C, of the spring-shell D, which is then pressed down and somewhat flattened, so as to expand the end portion C and cause it to fill the said cavity formed in the top surface of the cap A when secured in position on the material, forming one side portion of the opening or slit in the wrist of a glove, as shown in Figs. 9 and 10. This shell D is formed of sheet metal, having a somewhat conical shape, and provided with an internal annular shoulder, E, adapted to retain the split ring or circular spring H in its relative position within the said shell D when it is secured therein by means of the annular flanged spring-retainer G, which is placed over the lower end of the shell D after the spring-ring H has been inserted or placed therein, and then the flange G of the spring retainer is closed upon the said shell D, as shown in Figs. 9 and 10, whereby the spring is retained in position inclosed within the said parts loosely, so as to permit it to be expanded by the introduction of the head K of the shell-stud when pressed or forced through the said spring-ring H, which contracts about the neck L of the stud, so as to temporarily retain the same in position when secured upon the opposite side portion of the material forming the wrist of a glove, as shown in Figs. 8 and 10. It will be seen and understood that in order to secure the same permanently in position a small hole is cut out or punched through the material, then the flange J of the hollow stud is placed thereon, surrounding said hole, and then the point end N of the hollow rivet M is driven or forced within the said hollow stud and through the countersunk opening formed in the head end K thereof, and the end N of the rivet is upset therein or headed, so as to form a smooth oval finish or complete head to the stud, as shown in Figs. 8 and 10. It will be seen that the flange-head P of said hollow rivet M is brought to bear upon the opposite side of the material forming the wrist of the glove, so that the same is firmly held clamped between
456 & 457 the flange-head P of the hollow rivet and flange J of the hollow stud, and, also, that when the rivet is thus upset or headed its body M is somewhat expanded within the head portion of the said hollow stud, as shown in Figs. 8 and 10, whereby the two hollow sections forming this portion of the stud are more firmly united together.

It will be seen that by means of this peculiar construction of the head-end portion of the stud the same is left in a smooth finished condition, as desirable in use and operation as the same could be were the same turned and formed from solid metal (requiring much extra expense and greater difficulty to attach) as well as to overcome the objections found in those heretofore made with an open top or head of the stud and center opening left in the outer cap after the glove-fastener is attached to the glove, ready for use.

I have designed a modification of one section of the fastener wherein a single cap, D, serves to retain the spring-ring H in position in the said cap by connecting the lower end of the same with

the horizontal flange of the spring-ring retainer G, which is inserted within the lower end of the cap D, which is then closed inwardly over the same, so as to retain the said spring-ring H loosely in position therein and permit it to coact with the head K of the said shell-stud when brought in contact with the said spring, as above described. This section of the fastener may be secured to the material of the glove by means of the downward projecting or vertical portion R being inserted through an opening formed therein to receive it, and the washers S placed over the projecting tubular end, and then the said end turned over outward thereon and clinched down, as shown in Fig. 15, whereby this section of the fastening is secured in position, and is adapted to be connected with and disconnected from the other section, (shown in Figs. 6, 7, and 8,) as above described.

Having thus described my invention, what I claim is—

1. A glove-fastener consisting of the outer cap, A, having a central opening, B, surrounded by an annular cavity, the spring-shell D, provided with an annular shoulder, E, and closed top, which is fitted within the said opening B and headed down to fill the said cavity, and the spring-ring H and spring-retainer G, connected together and secured in position, as shown and described.

2. The stud consisting of the outer shell having the head K, provided with a countersunk opening, and the hollow rivet M, fitted within said opening, and the end N, headed down to fill the said cavity-opening, and thereby form a smooth head to the stud, connected together and secured in position, as shown and described.

3. The fastener consisting of the spring-cap shell D, provided with an annular shoulder, E, and closed top, and the spring-ring H, and spring-retainer G, connected together and secured in position and adapted to fasten with the stud, as shown and described.

EDWIN J. KRAETZER.

Witnesses:
SYLVENUS WALKER.
WILLIAM H. PARRY.

459–461 UNITED STATES PATENT OFFICE.

ALBERT G. MEAD, of Boston, Massachusetts, assignor of one-half of his right to Milton A. Kent, of same place.

Spring Glove or Garment Fastener.

Specification forming part of Letters Patent No. 227,440, dated May 11, 1880. Application filed July 15, 1879.

To all whom it may concern:

Be it known that I, Albert G. Mead, of Boston, county of Suffolk, and State of Massachusetts, have invented certain new and useful improvements in spring glove or garment fasteners, of which the following is a specification.

My invention relates to that class of fasteners composed of a stud on the one hand, and on the other hand of a button containing a spring to engage said stud and provided with an opening through which the stud may enter the button and reach the spring.

My invention consists in the construction and arrangement of the several parts of the fastener, as hereinafter described.

(Here follows diagram marked p. 458.)

In the accompanying drawings, figure 1 is a vertical central section of a button embodying my invention. Fig. 2 is a horizontal section of the same in the plane of the spring-jaws. Fig. 3 is an elevation of the button. Fig. 4 is a vertical central section of the stud. All the figures represent the parts on an enlarged scale.

In the several figures, *a* represents the metallic cap of the button; *b*, the spring; *c*, the disk on which the spring rests, and *f* the fastening-eyelet, by which the button is secured to the fabric or skin *e*.

In the button the disk *c* constitutes not only the support for the spring *b*, but also the bottom piece over the end of which the cap is swaged or pressed. The spring *b* is of the general form shown in Fig. 2. It is arranged and held between the plate or disk *c* and the cap *a*, its spring-jaws *b' b'* nominally closing together so as to be smaller in diameter than the central opening in the disk *c*. The stud *i*, when pushed up through the opening in the button, meets and with its rounded head pushes apart the spring-jaws, which close around the neck of the stud and lie in the annular groove *i'*, formed therein. The cap *a* is perforated centrally to allow the stud to be pushed up far enough to engage the spring. In lieu of perforating the cap, it may be raised centrally.

The stud may be of any approved construction. I prefer that shown in Fig. 4, the same being a construction which permits me to fasten it readily or securely in place on the fabric or skin. The lower end of the stud is made tubular and like an eyelet, as shown. In applying it to the skin the head of the stud is first passed upward through the hole in the skin, then the eyelet *g* is passed over

A. G. MEAD.

Spring Glove or Garment Fastener.

No. 227,440. Patented May 11, 1880.

No. 289.
B. & S. Fasteners &c. } p. 458.
Kratzer

Fig. 1,

Fig. 2,

Fig. 4,

Fig. 3,

WITNESSES

George
G. E. Andrews

INVENTOR

Albert G. Mead
by M. Bailey
his ATTORNEY.

the head of the stud and pressed down into place, and finally, in completing the operation of fastening, the eyelet *g* is pressed and spread so as to tightly embrace the inside of the turned lower or tubular end of the stud, which has hereinbefore been described as being in the shape of an eyelet, as plainly shown in Fig. 4. In this way the stud can be most firmly secured in place. At the same time it has no direct connection with the skin, but is held thereto simply through the intervention of the eyelet *g*.

Having described my improvements, what I claim, and desire to secure by letters patent, is--

1. The spring button-fastener composed of the cap *a*, the disk *c*, and the spring *b*, formed and supported at its opposite ends against the side of the cap, as described, and held closely between said cap and disk, a passage being formed centrally in the disk and cap to permit the entrance between the spring-jaws of the shank of the stud to be held, substantially as shown and set forth.

2. The stud formed with an eyelet-like lower end and provided with an independent encircling eyelet, by which the stud is attached and held to the fabric or skin, substantially as set forth.

ALBERT G. MEAD.

Witnesses:
F. CURTIS.
H. E. LODGE.

463 UNITED STATES PATENT OFFICE.

CLARK M. PLATT, of Waterbury, Conn.

Improvement in Shoe-fastenings.

Specification forming part of Letters Patent No. 181,979, dated September 5, 1876; application filed July 24, 1876.

To all whom it may concern:

Be it known that I, Clark M. Platt, of Waterbury, in the county of New Haven and State of Connecticut, have invented a new and useful improvement in fastenings for shoes, gloves, &c.; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, making part of this specification.

This invention is in the nature of an improvement in fastenings for shoes, gloves, and other similar articles of wearing apparel, or otherwise; and the invention consists in a tubular stud, constructed with an enlarged end and flanged base, combined with a tubular eyelet, which passes into the tubular stud, and having its inner end spread into the enlarged end of the tubular stud, (by which means the stud is attached to a shoe or glove,) when combined with an eyelet having a slot, all constructed and arranged substantially as hereinafter described.

(Here follows diagram marked p. 462.)

In the accompanying sheet of drawings, figure 1 is plan view, showing the stud and eyelet secured to a garment, and also showing the manner of securing the garment by means thereof; Fig. 2, a section, showing the attachment of the stud and eyelet to the garment.

Similar letters of reference indicate like parts in both figures.

A represents the stud, with an enlarged head, *a*, and a flange, *b*. This stud is tubular, as shown in Fig. 2, and the enlargement of the head *a* may be produced by indenting the end of the stud, as at *c*, or the enlargement may be formed in any desirable manner. The flange *b* is formed at right angles to the shank of the stud, and the stud in this way constructed is placed upon the surface of the fabric to which it is to be attached, a hole having been punched through the fabric, through which is inserted a tubular eyelet, B. This tubular eyelet consists of a shank, *e*, and a flange, *f*, at right angles to it.

To secure the stud to the fabric C the shank of the tubular eyelet B is inserted in a hole punched through the fabric, and passes into the interior of the tubular stud A, when, by a suitable compress applied to the flange *f* of the eyelet B, and the end of the stud, the inner end of the tubular shank *e* of the eyelet is spread into the

C. M. PLATT.

SHOE-FASTENING.

No. 181,979. Patented Sept. 5, 1876.

Fig: 1.

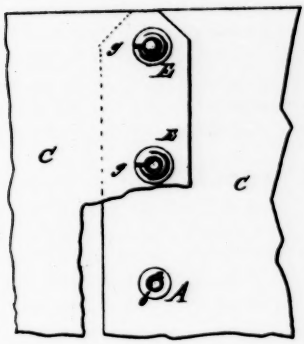
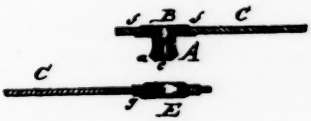


Fig: 2



No. 289.
B & S. Fastener Co.
v.
Kratzer.
} p. 462.

Witnesses:
M. Lovell
H. G. Mathewson

Inventor:
Clark M. Platt
per G. Mathewson
Atty.

enlarged head *a* of the tubular stud, effectually riveting and holding the eyelet to the stud, and clamping the fabric between the under side of the flange of the tubular eyelet, and the outer surface of the flange of the tubular stud.

This attachment of the stud is designed to be effected on one side of the opening of a glove, shoe, or other similar article, and to the other side of the opening is affixed an eyelet, E. This eyelet may be of any suitable construction, provided the continuity of its annulus is interrupted, as will be hereinafter shown, and also providing it has sufficient flange-surface, when affixed on both sides of the fabric to which it is attached, to keep it firmly in position. The eyelet does not form a complete annulus, but has a slot, *g*, cut into it, breaking the continuity of the annulus. This eyelet is secured to the fabric by punching a hole therein, passing the shank of the eyelet through the hole, and upsetting the end of the shank to form a flange, as in the application of ordinary eyelets; or it may be secured in any other desirable way. In all cases, however, the slot or opening *g* must be made through both flanges and the shank of the eyelet.

The eyelet and stud being now in position on opposite sides of the opening of the garment to which they are attached, to secure the sides of the opening it is simply necessary to pass the opening in the eyelet E over the end of the stud A, and press the eyelet over the stud, when the eyelet, by reason of the slot *g* formed therein, will spring open sufficiently to permit the enlarged head *a* of the stud to pass through the eyelet E, and the head, having passed through the eyelet, will again contract below the enlarged head, confining the eyelet to the stud until it is desired to remove it, which is accomplished by pulling the fabric with the eyelet upon it directly upward, when the eyelet will again spread and permit the head of the stud to pass through it.

Although this unfastening is easily accomplished when a direct upward strain is brought to bear on the eyelet E, yet when the fabric to which the eyelet and stud are attached is supported on a slight curve, as when on the hand or foot, no ordinary horizontal strain will separate the eyelet from the stud when once placed in position as a fastening. 464 & 465

Having now described my invention, what I claim as new, and desire to secure by letters patent, is—

1. A fastening for shoes, gloves, &c., consisting of a tubular stud, secured to the fabric by a tubular rivet, and combined with an eyelet with a slot formed therein, as and for the purpose described.

2. In a fastening for shoes, gloves, &c., an eyelet with a slot breaking the continuity of the annulus formed by the flanges and shank of the eyelet, as and for the purpose described.

CLARK M. PLATT.

Witnesses:
H. L. WATTENBERG.
M. LOVELL.

467 UNITED STATES PATENT OFFICE.

WILLIAM S. RICHARDSON, of Newton, assignor to Clarence John Blake, trustee, of Boston, Massachusetts.

Fastening for Gloves.

Specification forming part of Letters Patent No. 276,714, dated May 1, 1883. Application filed July 13, 1882; renewed March 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, William S. Richardson, of Newton, in the county of Middlesex and State of Massachusetts, a citizen of the United States, have invented a certain new and useful improvement in fastenings for gloves and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature, in which—

(Here follows diagram marked p. 466.)

Figure 1 represents a plan of a blank from which the socket member of the fastening is made. Fig. 2 shows the blank after it has been submitted to one operation, by which a portion of the socket is formed, the neck shaped, and the hole for the rivet or other fastening device formed. Fig. 3 is a plan of the completed socket member. Fig. 4 is a cross-section of the blank shown in Fig. 1 upon the line *x x*. Fig. 5 is a cross-section of the partly-formed blank shown in plan in Fig. 2 upon the line *y y*. Fig. 6 is a cross-section of the complete socket member shown in Fig. 3 upon the line *z z*. Fig. 7 is a plan of the blank from which the ball member of the fastening is formed. Fig. 8 shows the blank when partly formed. Fig. 9 represents another advance in the construction. Fig. 10 is a plan of the finished ball. Fig. 11 is a cross-section of the ball-blank upon the line *w w*, Fig. 7. Fig. 12 is a cross-section of the partly-formed blank upon the line *x x* of Fig. 8. Fig. 13 is a cross-section of the blank advanced to the stage shown in Fig. 9, upon the line *y y* of said figure. Fig. 14 is a cross-section of the finished ball upon the line *z z* of Fig. 10. Fig. 15 represents in plan the application of the complete fastening to a glove. Fig. 16 is a cross section upon the line *x x* of Fig. 15. Fig. 17 is a cross-section, illustrating a modified form of a part of the invention hereinafter described.

This invention is an improvement upon that described in my letters patent No. 260,050, dated June 27, 1882; and it consists particularly in various modifications and details of construction whereby the manufacture is simplified and cheapened, while the principle of operation of the invention remains the same.

The invention comprises two members, A B. The first or socket member, A, is formed from a flat blank shaped in plan substantially as shown in Fig. 1. This blank is struck up in suitable dies to the shape shown in Fig. 2—that is, the lower portion, *a*, of the socket is formed, the neck *b* is curved or rounded, and the part *c* at the end of the neck is shaped and provided with a hole, *c'*. The partly-

No. 289. Patented Dec. 4, 1883. p. 466.

(No Model.)

W. S. RICHARDSON.

FASTENING FOR GLOVES.

No. 276,714. Patented May 1, 1883.

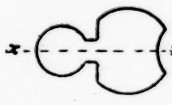


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

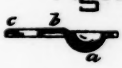


Fig. 5.

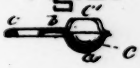


Fig. 6.

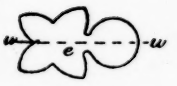


Fig. 7.

Fig. 8.

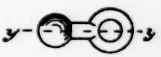


Fig. 9.

Fig. 10.

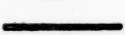


Fig. 11.

Fig. 12.

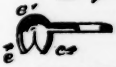


Fig. 13.

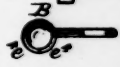


Fig. 14.

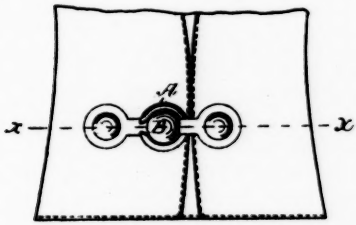


Fig. 15.

Fig. 16.

Fig. 17.

WITNESSES

Raymond S. Q.

Willard C. Fogg.

INVENTOR

William S. Richardson.

formed blank is then submitted to another forming operation in suitable dies, by which the portions *d* are folded up and drawn in over the lower portion, *a*, of the socket to the shape shown or substantially shown in Fig. 3, thereby completing the socket. The complete fastening will have the socket C, having spring sides *d*, the opening C′, the front notch or recess, *d*′, if desired, the neck or arm *b* ending in the circular portion *c*. Of course the socket may be fastened in place to the material by means of a rivet or eyelet passed through the hole in the part *c*, or through its bottom *a*, as represented in Fig. 17. It will be noticed that this form of socket member differs from that described in the patent in that the lower portion, *a*, of the socket and the sides *d* are continuous, not being separated by folding one part of the blank under another, as therein described, and by this method of construction less metal is employed and the construction is cheapened. The other or ball member of the fastening is made from a blank which is shaped in place substantially as shown in Fig. 7. The portion *e*, from which the spherical end of the fastening is made, may be square in shape, or may be shaped as represented in said figure, and on some accounts I prefer the latter shape. It is submitted to suitable forming-dies, which shape the cup or hemisphere *e*′, which forms a portion of the ball, the neck e^2, and its disk extension e^3. This shape is very well represented in Figs. 8 and 12. The blank thus shaped is then submitted to another forming operation in suitable dies by which the portions e^4 are bent to the shape shown in Figs. 9 and 13, and by another forming operation in suitable dies these portions e^4 are then closed inwardly toward each other to form the other part of the hemisphere, thus completing the ball. A spherical end or ball formed in this manner will have one half of its circumference without a seam or joint, while the other half will contain all the seams or joints; and it is intended that said portion shall be concealed from view when in use, thereby exposing the unseamed portion of the ball.

468 & 469

Having thus fully described my invention, I claim and desire to secure by letters patent of the United States—

1. A member of a fastening device comprising a socket, C, formed of sheet metal, and having the spring sides *d* or upper section thereof integral with the part *a*, forming its lower portion, all substantially as and for the purpose described.

2. The member of a glove or other fastening having the sides and bottom of the socket made from one piece of metal, as described, provided with the arm *b* and the extension *c*, all substantially as and for the purposes described.

3. A member of a fastening device having a spherical end comprising the hemispherical portion *e* and the rounded or curved portions e^4, all substantially as and for the purposes described.

4. The member of a fastening device having the spherical end B, formed as described, and the arm e^2 e^3, substantially as and for the purposes set forth.

WILLIAM S. RICHARDSON.

Witnesses:

F. F. RAYMOND, 2D.

WILLARD C. FOGG.

471–473 UNITED STATES PATENT OFFICE.

CHARLES H. MUMFORD, of Providence, Rhode Island.

Button and Stud.

Specification forming part of Letters Patent No. 231,234, dated August 17, 1880. Application filed December 1, 1879.

To all whom it may concern:

Be it known that I, Charles H. Mumford, of the city and county of Providence, and State of Rhode Island, have invented a new and useful improvement in buttons and studs; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, forming a part of the same, is a full, clear, and exact description thereof.

My invention relates to that class of buttons and studs made in two separable parts; and my improvement consists in the means employed for securing the parts against separation when they are combined, as will hereinafter appear.

(Here follows diagram marked p. 470.)

My improvement is applicable to sleeve-buttons, collar-buttons, studs, &c.; but for the purpose of illustrating my invention I have chosen a collar-button, which is represented in figure 1 of the drawings in central vertical section, the parts being combined, and in Fig. 2 in perspective, the parts being separated.

Referring to the drawings, A denotes the head of the button, and B the tubular stem attached thereto. C denotes the back or shoe of the button; D, the tubular post secured thereto; and E, a ball provided with a base, which is secured to the post or shoe.

As shown in Fig. 1, the external diameter of the stem is slightly less than the interior diameter of the post, and the diameter of the ball is equal to or slightly less than the interior diameter of the stem.

In order that the two parts of the button may be securely combined, the stem B is provided with one or more (preferably two) longitudinal slots, *b*, and its outer end, *b'*, is contracted or turned inward, so that when the said stem is inserted in the post and pressed home its contracted end will embrace the ball E and lock the parts of the button together.

Although I have shown and described the slotted stem as secured to the button-head, and the tubular post and ball as attached to the button-back, it is obvious that the stem may be applied to the back, and the post and ball to the head of the button, without affecting the co-operative relation of the parts.

I do not claim, broadly, a separable button one part of which is provided with spring-jaws to clasp a bulbous stem or projection on the other part; but

C. H. MUMFORD.
Button and Stud.

No. 231,234. Patented Aug. 17, 1880.

No. 289.
B. & S. Fastener Co. } p. 470.
v. Kraetzer.

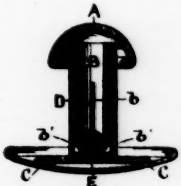


FIG. 1.

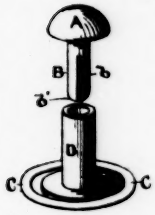


FIG. 2.

WITNESSES.

Charles R. Sisson
Henry W. Hayes.

INVENTOR.

Charles H. Mumford

What I claim is—

In a separable button, the head A and slotted tubular stem B, having a contracted outer end, in combination with the shoe C, the tubular post D, fast to said shoe and adapted to receive and fit around the stem B, and the ball E in the inner end of the post, adapted to be grasped by the contracted end of stem B when the latter is inserted in the post, all as shown and described.

CHARLES H. MUMFORD.

Witnesses:

CHARLES R. SISSON.

HENRY W. HAYES.

475 UNITED STATES PATENT OFFICE.

FRANCIS E. DRAKE, of Chicopee, Massachusetts, assignor to himself and George Arms, of same place.

Spring Clasp or Button.

Specification forming part of Letters Patent No. 43152, dated June 14, 1864.

To all whom it may concern:

Be it known that I, Francis E. Drake, of Chicopee, in the county of Hampden and State of Massachusetts, have invented a new and useful spring clasp or button for sword-belts, braces, jewelry, &c.; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

(Here follows diagram marked p. 474.)

Figure 1 is a front view of my clasp united; Fig. 2, a front view of the plate carrying the eyelet and slot and the spring to secure and hold the button in place. Fig. 3 is a sectional view of the same at the line *x x* of Fig. 2. Fig. 4 is a back view of the same, showing the spring in place. Fig. 5 is a front view of the plate carrying the button. Fig. 6 is a section of the same at the line *y y* of Fig. 5. Fig. 7 is a back view of the same. Fig. 8 is a front view of my improvement as applied to a bracelet or jeweler's clasp. Fig. 9 is a back view of the plate carrying the eyelet-slot and spring. Fig. 10 is a side view of the same. Fig. 11 is a back view of the plate carrying the button, and Fig. 12 is a side view of the same.

It is the object of my invention to provide a secure clasp or button fastening, susceptible of a vibratory motion or of being made rigid, that can be united or separated with ease and when united will not open from use; and to this end my invention consists in a clasp made of two plates of metal, one of which carries a stud terminating in a button and the other an eyelet to receive the button, a slot to receive the shank of the stud, and a spring to retain the shank within the slot, and these so united as to permit the shank of the stud to vibrate within the slot where it rests, or both plates to be rigidly united together, while in either form the clasp can be separated with ease, but will not be liable to come apart from or while in use.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

From sheet metal of suitable strength cut a blank, A, in any ornamental shape desired. From the center, or near it, punch a hole, *a*,

F. E. Drake.

Spring Clasp.

No. 43,152. Patented Jun. 14, 1864

Fig. 1.

Fig. 2.

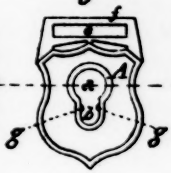


Fig. 3.

Fig. 4.

Fig. 5

Fig. 6.

Fig. 7.

Fig. 8.

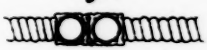


Fig. 9

Fig. 10

Fig. 11

Fig. 12.

No. 2,879. A. H. Fenton Company's Patent 4,474. H. Kraetzer.

Witnesses.

J. Snowden Pike.

F. Schmidt.

Inventor.

F. E. Drake

by his Attys

Baldwin & Son

and a slot, *b*, to receive the button *c* and the shank *d*, which is fastened securely in or near the center of the other leaf or half, B, of the clasp, also cut from the sheet metal. The upper and lower edges of the leaves A and B of the clasp must be punched with suitable openings, *e* and *e'*, so as to leave a bar or bars, *f* and *f'*, by which to attach the leaves of the clasp to the articles they are to be used with, or it is obvious that rings, rivets, or solder may be used for such attachments.

Around the central opening, *a*, in the plate A, and on the inner or under surface of the plate, from one side of the slot *b* to the other, a continuous depression or countersink is made near to the edge of the opening and wide and deep enough to receive a wire spring, *g*, and retain it even with or below the surface of the plate. The spring *g* is fastened at its center by a screw-rivet or solder in the groove in the plate, while its ends project over or beyond the edges of the slot and form a stop to retain the shank or stud *d* when resting in the slot *b*, as shown in the drawings.

Now, when the button *c* of the plate or leaf B is passed through the central opening, *a*, in the plate or leaf A, the stud or shank *d* will be easily slipped past and between the ends of the spring *g* into the slot *b*, where it will be retained by the button *c* and the projecting ends of the spring. It is obvious that to remove the shank to separate the leaves of the clasp it will be necessary to use just force sufficient to draw the shank from between the ends of the spring when the button will come opposite to and can be withdrawn easily through the central opening. It is also obvious that if the shank *d* be made round and fit loosely in the slot *b* the leaves will have a vibratory motion, and can be adapted to various uses requiring such a yielding motion in the clasp, or it will be equally manifest that by making the shaft *d* square and to fit neatly in the slot *b* the leaves will have no vibration, but be rigid and better adapted to other uses.

When it is desired to use my clasp in fine jewelry, it is obvious that the leaves 9 and 11 may be soldered to the ends of the chain, bracelet, or locket to which they may be attached, while the slot 10 and stud or button 12 are secured in the under plate of the clasp, and such fastenings can be made either flexible or rigid by the means already described or by inserting the stud into its slot at the side of the clasp 9, and letting the two inner edges of the leaves meet with a close joint. These edges will brace the clasp rigidly, as shown in Fig. 8, and prevent it from vibrating, while by curving the inner edges of the leaves the clasp will be flexible.

476–481

My invention is obviously of a wide and beneficial application to wearing apparel and to many other uses, and is capable of being advantageously substituted for many known fastenings and of a great variety of ornamentation.

What I claim as my invention, and desire to secure by letters patent, is—

A clasp or button fastening constructed, arranged, and operating substantially in the manner described.

In testimony whereof I have hereunto subscribed my name.

FRANCIS E. DRAKE.

Witnesses:

K. HENDALL.

S. F. STEBBINS.

(Here follow diagrams marked pp. 478 & 480.)

D. Rail.

Shirt Stud.

No. 8860. Patented Apr. 6. 1852

Fig 1.

No. 289.
B. & J. Fratinus
Company
N. Knaltzel.
} p. 478.

Fig 2.

Fig 3.

C. McIntire,
Button.

No. 22442. Patented Dec 28 1858.

Fig 1.

Fig 2.

Fig 3.

No. 289.
B & S. Fastener Co. } p. 450
N. Keatzer.

Fig 4.

Fig 5.

Fig 6.

Fig 7.

Wm M Goodine
F. L. Jones

Charles A. McIntire

R. B. Ruggles,
Button.

No. 49305. Patented Aug 8. 1865

No. 289.
B & S Fastener
Company
v.
Kraetzer. } p. 482.

Witnesses
Attest B Ruggles
C. R. Burnham
Jno. Wells

483–485 UNITED STATES PATENT OFFICE.

ROB'T B. RUGGLES, of Hartford, Connecticut.

Shirt-stud.

Specification forming part of Letters Patent No. 49305, dated August 8, 1865.

To all whom it may concern:

Be it known that I, Robert B. Ruggles, of Hartford, county of Hartford, and State of Connecticut, have invented certain new and useful improvements in shirt-studs, &c.; and I do hereby declare that the same is described and represented in the following specification and drawings, and to enable others skilled in the art to make and use the same, I will proceed to describe its construction by referring to the drawings, in which the same letters indicate like parts in each of the figures.

(Here follows diagram marked p. 482.)

This improvement relates to that kind of studs which are made in two parts for the purpose of being more easily inserted through the button or eyelet hole, for the purpose of preventing tearing or otherwise injurying the hole.

In the accompanying drawings, *a* is a button, having a hollow stud, *b*, the hole of which is bored larger through the button than at the inner end of the stud, the inner end of which is slitted, so as to allow the end to spring. *a'* is another button, having a shank, *c*, the inner end of which is made a little larger than it is nearer to the button, so that as the shank *c* is inserted into the stud *b* it will spread and again close up as the shank *c* is pushed into the stud. Thus the two buttons *a* and *a'* are held together with sufficient tenacity to prevent their being accidentally disengaged, but may be easily drawn apart by pulling one of the buttons squarely from the center.

I believe I have thus described this improvement so as to enable a person skilled to make the same therefrom.

What I claim, therefore, and desire to secure by letters patent, is—

As a new improved article of manufacture, the button *a*, having an unequally perforated and slitted stud, *b*, in combination with the button *a*, having an unequal-sized shank, *c*, working together substantially as and for the purpose described.

ROB'T B. RUGGLES. [L. S.]

Witnesses:
E. R. BURNHAM.
J. W. BLISS.

487–489 UNITED STATES PATENT OFFICE.

FREDERIC I. PALMER, of Springfield, Massachusetts.

Improvement in Buttons.

Specification forming part of Letters Patent No. 53471, dated March 27, 1866.

To all whom it may concern:

Be it known that I, Frederic Ingersoll Palmer, of Springfield, Hampden county, Commonwealth of Massachusetts, have invented certain improvements in buttons; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to letters of reference marked thereon.

(Here follows diagram marked p. 486.)

In the drawings, figure 1 is a side view of my button as attached to the cloth. Fig. 2 shows the same with the top removed. Fig. 3 shows the wire spring hereinafter described. Figs. 4 and 5 represent the stud, and Fig. 6 is a section through the button complete.

This invention consists in an improved button which can be attached to the garment without sewing, and also in so arranging the parts that they can readily be removed without injury, so that they may be used a number of times and on different garments, if desired.

I will now describe how I accomplish this. In construction this button consists of an under shell, A, which rests on the cloth. Through the cloth and through this shell passes the stud B. This stud B is notched on two sides at *a a*, and the top is pointed, so that when forced upward it presses aside the parts *b b* of the spring C and they, springing back into these notches, firmly hold the stud from slipping back.

The spring C is held down by a disk, D, on top of it, and the space E between this disk and the cover F of the button is filled with paper or other packing.

Although this button is firmly held in place on the stud and no ordinary twist can move it, still if the button be held and a strong twist given to the stud the wires *b b* are forced out of the notches *a a* and the stud can be taken out and be replaced with the button on another garment or piece of cloth or other desired situation.

The advantages of this arrangement can readily be perceived, as these buttons are simple and cheap in construction, easily put onto any garment without thread, and, if desired, can be readily removed and placed on any other.

Now, having described my invention, what I claim as new, and desire to secure by letters patent, is—

The combination of the stud B, notched as described, with the spring C and other parts of the button, substantially as herein set forth.

F. I. PALMER.

Witnesses:

J. B. GARDINER.

EDWARD H. HYDE.

F. I. Palmer.

Button.

No. 53,471 Patented Mar. 27, 1866.

No. 289.
B & S Fastener Co.
v.
Kratzer.
} p. 486.

Inventor
F. I. Palmer
by Dewey & Co. Attorneys of B. Fastener Co.
Witnesses
Edward H. Hyde
Jerome E. Bellis

F. I. Palmer.

Button.

No. 53,472. Patented. Mar. 27. 1866.

No. 289.
B. & S. Gaslamp Co.
Sp. 490.
Kratzer.

Fig 4.

Fig 5.

Fig 6.

Fig 1.

Fig 2.

Fig 3.

Witnesses,
Joseph Degenheimer
Fred. Bird

491 UNITED STATES PATENT OFFICE.

FREDERIC INGERSOLL PALMER, of Springfield, Massachusetts.

Improvement in Fastenings for Garments.

Specification forming part of Letters Patent No. 53472, dated March 27, 1866.

To all whom it may concern:

Be it known that I, Frederic Ingersoll Palmer, of Springfield, in the county of Hampden and State of Massachusetts, have invented certain improvements in fastenings for garments and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a section through my improved button, showing the manner of attaching it to a garment. Fig. 2 is a plan of the back or collet of the button. Fig. 3 is a perspective view of the same. Fig. 4 is a view of the stud by which the button is attached to a garment. Fig. 5 is a plan of the inner side of the collet or back of the button with the stud in place. Fig. 6 represents a stud of a different construction, to allow of the button being detached, if desired.

My invention consists in forming and attaching buttons and ornaments to garments and other articles without sewing, riveting, or clinching, by which they may be securely attached in an expeditious manner. This I accomplish by forming the back or collet of a button or ornament in such a manner that a detached stud may be forced through an opening in the back or collet, which then springs over a shoulder or into notches on the end of the stud, and secures the button or ornament in place.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

(Here follows diagram marked p. 490.)

In the said drawings, *a* is the shell or front of a button to which is attached the back or collet *b*, in which are punched openings *c*, the portions between which are bent up, as seen in Figs. 1 and 3, forming springs *d*.

A is a stud of the form seen in Figs. 1 and 4, the shank *f* of which is turned down so as to leave a shoulder, *g*, from which it slopes to a point, *h*, which facilitates its entrance into the opening *i*, Fig. 2, between the springs *d*.

Any required number of springs may be cut in the collet or back of the button.

A hole being made in the article B, to which the button is to be attached by means of any sharp-pointed instrument, the point *h* of

the shank *f* of the stud A is forced through, or in some cases, if preferred, the point *h* of the shank may be forced through the material without first making a hole. The button is then placed with the opening *i* on the point *h* of the stud and pressure applied so as to force the springs *d* over the shoulder *g*, the springs closing down around the shank, as seen in Fig. 1, holding the button firmly to the garment, the large head *j* of the stud preventing it from being pulled through the cloth or other material.

It will be seen that the form of the springs *d* is such (being bent near the center) that any strain brought onto the button will tend to draw the springs tightly together under the shoulder *g*, and thus hold the parts more firmly in place, and that when the button is once secured to the cloth or other material it cannot be detached if turned or bent over in any direction.

When it is desired to make the button removable, instead of forming a shoulder on the full circumference of the stud, as above described, the shank may be made plain, as seen in Fig. 6, with notches *k*, into which the springs in the collet or back will enter when the stud is forced into place, the number of notches corresponding to the number of springs in the collet; and when so constructed, by turning the button on the shank, so as to bring the full portion of the shank opposite to the openings between the springs, the bottom can be instantly removed, the springs being in correspondence with the plane surface of the shank of the stud. In other words, though the springs and the part they act upon are the same, their continuity is interrupted so as to admit of the release of the attachment.

I have thus far described my invention as applied to buttons and the method of attaching them to cloth and other materials; but other ornaments may be attached in a similar manner to various articles or things by using a stud of the proper length and snapping the ornaments to which the springs are attached onto the stud—for instance, plate trimmings and other ornaments for harnesses, and my invention may also be applied to jewelry of various kinds.

492 & 493 A plain stamped button made in one piece without a collet may be struck up so as to form springs and openings similar to those in the collet of the above-described button.

It is contemplated within the scope of this invention to connect two buttons or other objects together to form links or bonds of union, by simply duplicating the means of attachment herein shown.

Without intending to limit myself to the construction of buttons or any other subject or class of subjects, but intending to apply my invention to the attachment of ornaments to wearing-apparel, harness, and to everything for which it is applicable, I claim—

The attachment or fastening composed of the springs and the pin or stud, substantially as herein shown and described.

FREDERIC INGERSOLL PALMER.

Witnesses:
W. H. ALLIS.
J. R. BURNETT.

I. Cole,
Button.

No. 88,451. Patented Mar. 30. 1869.

No. 289.
B. & S. Fastener Co. } p. 494.
v.
Kraetzer.

Fig: 1

Fig: 2.

Witnesses:
C. F. Kastenhuber
Chas Wahlers

Inventor:
Isaac Cole
By Van Santvoord & Hauff
his Attys

495–497 UNITED STATES PATENT OFFICE.

ISAAC COLE, of New York, N. Y.

Letters Patent No. 88451, dated March 30, 1869.

Improvement in Buttons.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, Isaac Cole, of the city, county, and State of New York, have invented a new and improved collar-button; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

(Here follows diagram marked p. 494.)

Figure 1 represents a central section of this invention.

Figure 2 is a similar section of a modification thereof.

Similar letters indicate corresponding parts.

This invention relates to an improvement upon the invention of A. K. Browne, for a collar-button, for which letters patent were granted, September 25, 1866, said invention consisting of a button, the back and the head of which are united by a spring-catch, which is attached to the head, and which, when said head is inserted into the shank, catches under a stop, or shoulder in the interior of the shank, from which it can be released by the pressure of the finger on a button inserted into the inner end of the shank, and provided with an inclined plane, in such a manner that the shank of the button-back can be readily passed through the holes of the shirt-band and collar, and the head can be easily attached and detached without injuring or spoiling the appearance of the collar.

My improvement consists in securing to the head and the back of the button, tubular shanks, which fit into each other. One of these tubes contains the spring-catches, and the other contains the ring, which operates with the catches, to hold the head and back in position, and also the button, which causes the disengagement of said head and back.

The tubes enclose the spring-catches and ring, and present the appearance of a solid shank, with which the cloth will be in contact when the button is applied to the garment.

A represents my collar-button, which is composed of the head *a* and back *b*.

From the head extends a tubular shank, *c*, which fits into the tubular shank *d* of the back.

To the interior of the tube *c* are secured one or more catches, *e*,

(two being shown in the drawing,) and if said tube is forced down into the shank *d*, these catches slide over and finally catch under the ring *f*, which is secured in the interior of the shank *d*, and thereby the two parts are firmly locked together.

Through the inner end of the shank *d* is introduced a button, *g*, which is provided with a central conical depression, forming inclined planes, *h*, and if said button is crowded in, these inclined planes act on the spring-catches, and compress the same, so that they release the ring *f*, and the head *a* can be withdrawn.

When the head is reinserted, the button *g* is forced back to its original position.

To prevent said button from dropping out of the shank, it is provided with a shoulder, *i*, which catches up against an internal flange, or lip, *j*, as shown in Fig. 1; or, instead of this lip, or flange, a pin, *i**, may be employed, which works in suitable grooves, *j**, in the shank, as shown in Fig. 2.

By these means, a collar-button is obtained which can be readily inserted without straining the button-holes of the shirt-band, or collar, and without spoiling the smoothness of the latter; and furthermore, a slight pressure on the button *g* is sufficient to disengage the head, so that the button can be removed without trouble.

The head of the button is rounded, and projects but very little beyond the back plate of the button, so that it cannot possibly incommode the wearer; and notwithstanding this fact, it is so situated that it can be readily reached and operated.

By placing the ring, or shoulder *f* into the interior of the shank, the locking-devices are entirely concealed when the button is in use, and they are not liable to catch in the shirt.

Having thus described my invention,

What I claim as new, and desire to secure by letters patent, is—

The tubular shanks *c d*, fitting within each other, one of which is secured to the head *a*, and receives the spring-catches *e*, and the other is secured to the back, *b*, and contains the ring *f* and button *g*, constructed and operating substantially as and for the purpose described.

ISAAC COLE.

Witnesses:

W. HAUFF.

E. F. KASTENHUBER.

D. M. Somers & W. S. Atwood.

Button.

No. 3421. Reissued May 4. 1869.

Fig. 1.

Fig. 2.

Fig. 5.

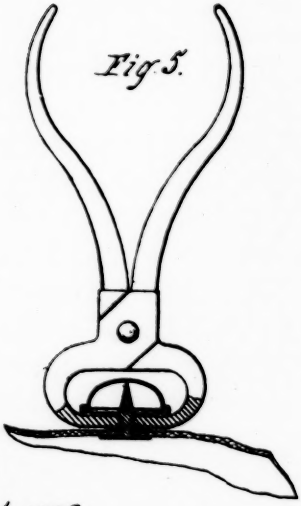


Fig. 3.

No. 289.
O. & S. Fastener Co. } p. 498.
v. Kracker.

Fig. 4.

Witnesses.
C. J. Crockett
Charles A. Harrison.

Inventors.
D. M. Somers.
W. S. Atwood

499–501 UNITED STATES PATENT OFFICE.

W. H. REED, of New York, N. Y., chairman of committee on organization, assignee of D. M. Somers and Walter S. Atwood.

Letters Patent No. 79929, dated December 31, 1867; Reissue No. 3421, dated May 4, 1869.

Improvement in Buttons.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that the following is a full, clear, and exact description of an improvement in buttons, or improved mode of fastening buttons to materials of various kinds, invented by D. M. Somers, of the city of Brooklyn, in the county of Kings and State of New York, and Walter S. Atwood, formerly of the city of Newark, in the county of Essex and State of New Jersey, but now of Brooklyn aforesaid, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming a part of this specification, and in which—

(Here follows diagram marked p. 498.)

Figure 1 represents a transverse section of military button; and

Figure 2, a view of an independent central stem or rivet, for use in connection therewith.

Figure 3 represents similar views of a different style of button, and independent central stem or rivet to suit; and

Figure 4, a sectional view of said button and rivet, as united by compression, and holding a piece of cloth or material in between them.

Figure 5 is a similar view to Fig. 4, in illustration of how the compression may be produced, to effect the fastening of the button to the cloth or other material, in accordance with this invention.

The invention consists in combining with the neck or shank of the button, an independent central stem or rivet, when said neck and stem are so constructed as that the one may be made to enter the other, and the two be secured together by compression applied laterally, or to the outside of them, in rear of the button, for the purpose of fastening the latter to the material.

To enable others skilled in the art to make and use the invention, the construction and mode of attaching buttons, according to the modification shown in the drawing, will now be proceeded with.

A button, as shown in Fig. 1 of the accompanying drawing, is constructed of any suitable material, style, and kind, with a back that has its centre extended into a hollow cylindrical neck or

shank, marked N, the lower end of which is expanded into a flange marked F.

There is also constructed, a second piece or central stem, with a disk at one end, as shown in Fig. 2, or as at S in Fig. 3.

The portion of the stem which lies within the neck N is reduced in diameter, as shown at A in Fig. 2, or may be reduced from opposite sides, as shown at A in Fig. 3.

This stem may be pointed, to pierce the cloth when the button is of such hollow character as to receive a pointed extension of said stem

To attach this button to the cloth or other material, the central stem or rivet, as it may be termed, is passed through the material, into the neck of the button, and, by means of a suitable instrument, which may be constructed as shown in Fig. 5, the neck is compressed to fit the reduced portion of the stem, as shown in Figs. 4 and 5, thus attaching the button to the stem and firmly clasping the cloth.

Among the advantages claimed for this mode of fastening are, its adaptability to buttons in use, the great rapidity with which the button may be attached, and its permanent and erect position upon the goods when attached.

What is here claimed, and desired to be secured by letters patent, is—

The combination, with the button or its shank or neck, of an independent central stem or rivet, when said neck and stem are so constructed as that the one may be made to fit within or enter the other, and the two be secured together by compression applied laterally, or to the outside of them, in rear of the button, between the latter and the material to which the button is attached, substantially as specified.

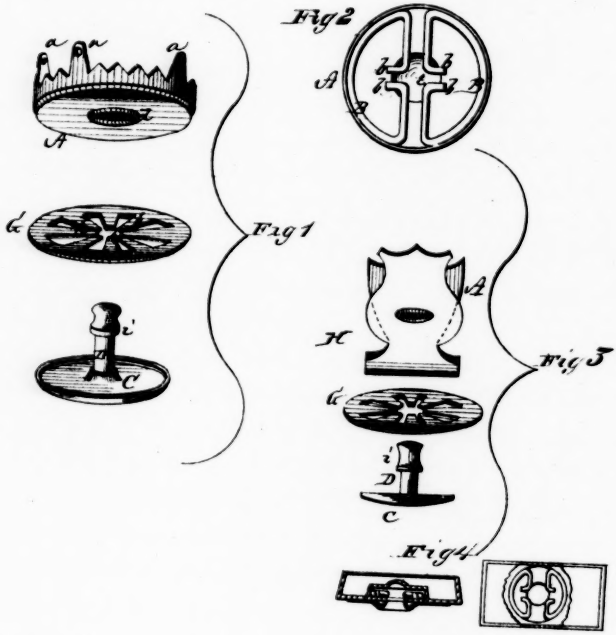
W. H. REED.

Witnesses:
D. M. SOMERS.
W. S. ATWOOD.

C. N. BROWN.

STUDS AND BUTTONS.

No. 178,726. Patented June 13, 1876.



No. 289.
B & S. Fastener
Company.
v.
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p. 502

WITNESSES
Franck L. Durand
C. L. Ernst

By

INVENTOR
C. N. Brown
Alexander Mason
Attorney

503 UNITED STATES PATENT OFFICE.

CHARLES N. BROWN, of Watchemoket, Rhode Island.

Improvement in Studs and Buttons.

Specification forming part of Letters Patent No. 178,726, dated June 13, 1876; application filed October 4, 1875.

To all whom it may concern:

Be it known that I, Charles N. Brown, of Watchemoket, in the county of Providence and in the State of Rhode Island, have invented certain new and useful improvements in sleeve-buttons, shirt-studs, and collar and neck-tie fasteners; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a combined collar-button and neck-tie fastener, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

(Here follows diagram marked p. 502.)

Figure 1 is a perspective view, showing the parts of my combined collar-button and neck-tie fastening detached. Fig. 2 is an interior view of the part attached to the neck-tie. Fig. 3 shows the same invention applied to a back collar-button, and Fig. 4 shows part of my invention applied to a sleeve-button or shirt-stud.

A represents a case or box, struck up from sheet metal, in two parts, and soldered together. Within this case are placed two springs, B B, each bent in semicircular form, and their ends *b* bent inward and then outward from the center of the case, as shown particularly in Fig. 2.

From the back of the case A project lugs or ears *a a*, which are to pass through slits in the neck-tie shield, so that the case will be on the back of the neck-tie, and the case is then fastened to the shield by rods or wires passing through the lugs, or in any other manner that may be deemed most convenient.

In the outer disk of the case is a central aperture, *d*, and in the inner disk, directly opposite the same, is a depression, *e*, as shown.

C represents a disk, having a center shank, D, projecting from the same; and on the end of this shank is a shoulder, *i;* or, in other words, a head, is formed on the end thereof. This shank or button-post is formed of small wire by suitable machinery.

G represents a circular plate, cut out with a central hole, and from

this hole are cut a series of radial slots, forming a series of spring-tongues or ribs, *h h*.

The shank or post D is to be passed from the inside through the neck-band of the shirt and through the ends of the collar, and then the plate G put on the end of the post, so that the ends of the tongues *h* will catch on the shoulder *i* of the post, thus holding the disk C in its place to fasten the collar before the neck-tie is put on, which may not always be convenient or desirable to do at once. The neck-tie is then put on by pressing the case A onto the end of the shank until the bent ends *b* of the springs B B catch on the shoulder *i*, which completes the fastening.

By this means the collar and neck-tie may be securely fastened in a very short time, and without the least trouble or annoyance.

The same principle may be applied to a button, H, for fastening the collar at the back of the neck, as shown in Fig. 3; and the double spring may be applied in precisely the same manner to sleeve-buttons, shirt-studs, and other similar articles.

I am aware that buttons have been made in which a single spring is made to hold a shank or post, so that the two parts of the button can be separated at will.

By my invention of the two semicircular springs, with their ends bent, as described, a bearing is given to the post of the button upon four sides, whereby any tendency to relieve the button by lateral pressure cannot turn the post through the spring more easily in one direction than it does in another, which is a serious objection to the use of the single spring when used in a very thin or shallow button, where there can be but little or no lateral support to prevent the post from declining from a perpendicular position from the face of the button. In such a case the post can be pulled out by a small strain when the post inclines upon the line in which the single spring opens, but when inclining across that line it cannot be drawn out by much force, thus rendering the single spring impracticable for use in very shallow buttons.

504 & 505

Another advantage of importance obtained in using the double spring is their greater elasticity, opening upon four sides equally at the same time. They can be inclosed within a smaller circle, and also endure much greater service, holding the post more securely in every position.

Having thus fully described my invention, what I claim as new, and desire to secure by letters patent, is—

1. The case A, provided with the two springs B B, each bent in semicircular form, with their four ends *b* bent inward and thence outward from the center of the case, in combination with the disk C, having shank D with shoulder *i*, substantially as and for the purposes herein set forth.

2. The circular plate G, having a central hole and a series of radial slots cut therein forming a series of spring-tongues, *h*, in combination with the case A, and springs B, and the disk C, with its

shouldered shank, substantially as and for the purposes herein set forth.

3. The combination of the case A, having projected ears *a a* and springs B B, as described, the circular plate G, with its spring-tongues *h*, and the disk C, with its shouldered shank D *i*, all constructed substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of September, 1875.

CHARLES N. BROWN.

Witnesses:

WILLIAM W. RICKARD.
CHRIS. J. DODGE.

507–509 UNITED STATES PATENT OFFICE.

ALBERT E. NEWCOMB, of Boston, Massachusetts.

Improvement in Buttons.

Specification forming part of Letters Patent No. 155,383, dated September 29, 1874; application filed July 3, 1874.

To all whom it may concern:

Be it known that I, Albert E. Newcomb, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful improvements in buttons; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in self-fastening buttons, consisting of a plate to which is attached a cylindrical shank, that is provided with an annular V-shaped groove close to the said plate, that is in a like manner provided with an annular tapering recess surrounding the annular V-shaped groove on the shank, in combination with a fastener consisting of a perforated plate provided with an annular elastic split cylinder, the upper end of which is provided on the inside with an annular sharp projection, that is made to fit and rest in the annular V-shaped groove on the aforesaid button-shank, as will now be herein more fully shown and described.

(Here follows diagram marked p. 506.)

On the drawing, figure 1 represents a central longitudinal section of my improved button and its fastener when secured together. Fig. 2 represents a central longitudinal section of the button without the fastener. Fig. 3 represents a ground plan of the fastener; and Fig. 4 represents a cross-section on the line A B, shown in Fig. 3.

Similar letters refer to similar parts wherever they occur on the drawings.

a represents the button, provided on its under side with a cylindrical shank, *b*, as shown. An annular V-shaped recess, *c*, is formed at the junction of the shank *b* and button *a*, by the making of an annular groove on the shank *b*, and an annular projection, *d*, on the under side of the button *a*, as shown. The fastener consists of a plate, *e*, that extends upward as a hollow cylinder, *f*, of an inner diameter equal to the diameter of the cylindrical shank *b*. The cylinder *f* is slotted in four places, *g g g g*, as shown, and furthermore provided at its upper end with an inner-projecting V-shaped edge, *h*, of a form and shape similar to the annular recess *c* at the base of the shank *b*. The projecting V-shaped edge *h*, as well as

A. E. NEWCOMB.

Buttons.

No. 155,383. Patented Sept. 29, 1874.

No. 289
B. & S. Fastener Co. } p. 506
v.
Kraelzer.

Fig. 1.

Fig. 2.

Fig. 3.

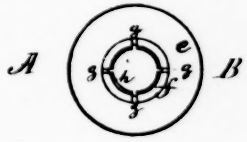


Fig. 4.

WITNESSES:
John R. Heard
by Francis Allen

INVENTOR:
Albert E. Newcomb
by Allan Andrew
atty.

the upper end of the yielding split cylinder *f*, will expand when inserted therein, and when the said shank *b* is so far put through the cylinder *f* that the projecting edge *h* reaches the annular V-shaped groove *c*, the cylinder *f* will then contract and lock itself firmly to the button. The edge *h*, resting in the recess *c*, prevents the button *a* from ever getting detached from the fastener *e f*. To attach this my improved button to garments of any kind, or any articles where buttons are required, it is only necessary to make a hole in the article to which the button is to be attached, of a size equal to the outer diameter of the cylinder *f*, through which perforation the said cylinder is inserted, after which the shank *b* is pushed into the cylinder *f* so far that the sharp edge *h* comes to rest in the V-shaped groove *c*, when the fastener gets so firmly secured to the button that it cannot be detached therefrom without breaking it to pieces.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by letters patent, and claim—

The button *a*, having the shank *b* and V-shaped recess, in combination with the plate *e* and the split cylinder with its re-entrant edge, substantially as described.

In testimony that I claim the foregoing as my own invention, I have affixed my signature in presence of two witnesses.

ALBERT E. NEWCOMB.

Witnesses:
ALBAN ANDRÉN.
JOHN R. HEARD.

511-513 UNITED STATES PATENT OFFICE.

ERNST SCHNOPP, of East New York, N. Y.

Improvement in Pocket-book Fastenings.

Specification forming part of Letters Patent No. 180,938, dated August 8, 1876. Application filed June 30, 1876.

To all whom it may concern:

Be it known that I, Ernst Schnopp, of East New York, in the county of Kings and State of New York, have invented a new and improved pocket-book fastening, of which the following is a specification:

(Here follows diagram marked p. 510.)

In the accompanying drawing, figure 1 represents a front view of my pocket-book and lock, showing it in closed position. Fig. 2 is a front view of the same in open position; Fig. 3, a vertical transverse section of the lock.

Similar letters of reference indicate corresponding parts.

The invention has reference to a neat and simple pocket-book lock, that works with great facility and convenience; and it consists of a face-plate with swinging handle or bail applied to the closing-flap of the pocket-book, and having a center knob or button at the under side of the same, that enters a centrally-perforated radial spring-plate for closing the lock, the button being released by pulling at the face-handle.

In the drawing, A represents the face-plate of my improved pocket-book lock, which face-plate carries a semicircular pivoted handle or bail, B, that swings down on the face-plate, to be seated on the same when not required, and into outward position at right angle thereto, against shoulders or stops of the face-plate. The face-plate A is secured to the closing-flap of the pocket-book by being applied by means of bent hooks *a* to a recessed plate, C, at the under side of the flap. The plate C carries a central button or knob, *b*, that is tapered or rounded off from the shank to the largest part, and from that point to the end, for the purpose of entering and leaving easily a radially-slotted spring-plate, D, secured to a base-plate, D′, of the pocket-book. The radial spring-plate D and base-plate D′ have center perforations *d*, of less width than the diameter of the button at its largest or most bulging part, so as to bind on and provide space for the button sufficiently to retain it in locked position. The lock is closed by merely pressing the face-plate down so that the button is forced through the perforation of the spring-plate, and retained by the radial sections of the same. For opening the lock the face-handle is taken hold of, and the button released by the giving of the radial-spring parts the conical shape of the button, facilitating the opening and closing of the lock.

E. SCHNOPP.

POCKET-BOOK FASTENING.

No. 180,938. Patented Aug. 8, 1876

No. 289. B. & S. Fastener Co. } p. 510. Kraetzer.

Fig: 1.

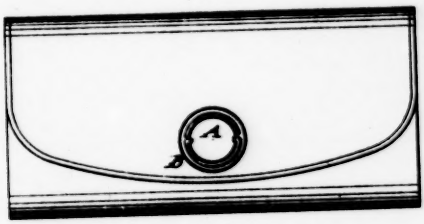


Fig: 2.

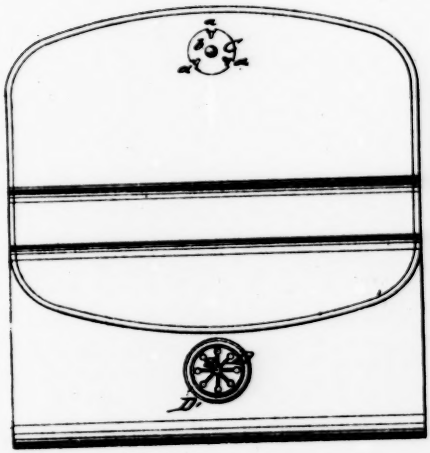


Fig: 3.

WITNESSES:

Chas. Nida

John Gerhals.

INVENTOR:

E. Schnopp

BY Munn & Co

ATTORNEYS.

The lock is readily operated, simple in construction, and of neat and compact appearance.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

A pocket-book lock, composed of a face-plate with swinging operating-handle, and central tapering button at the under side of flap, in combination with a radially-slotted and centrally-perforated spring-plate, substantially as and for the purpose specified.

ERNST SCHNOPP.

Witnesses:

PAUL GOEPEL.
T. B. MOSHER.

515-517 UNITED STATES PATENT OFFICE.

CLARENCE A. WOOD, of Wappinger's Falls, New York.

Improvement in Sleeve or Collar Buttons.

Specification forming part of Letters Patent No. 203,308, dated May 7, 1878; application filed October 15, 1877.

To all whom it may concern:

Be it known that I, Clarence A. Wood, of Wappinger's Falls, county of Dutchess, and State of New York, have invented a new and useful improvement in sleeve or collar or bosom buttons or studs, of which the following is a specification that will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, in which—

(Here follows diagram marked p. 514.)

Figure 1 is a vertical sectional view, in perspective, of my stud complete; Fig. 2, a horizontal section of the same on the line 1 1 of Fig. 1; Fig. 3, a perspective view of the under side of the button-face, and Fig. 4 a similar view of the back.

I form my stud of two main parts, A and B, detachable from each other, as illustrated in Figs. 1 and 2.

One of these parts, A, consists of an ornamental button-face, having secured upon its back a post, P, and two pins or spurs, *s s*, on opposite sides of the post. On the outer end of this post a rounded or cone-shaped cap, *p*, is formed by cutting away the opposite sides of the post, and forming the slots *p' p'*, thus leaving a flat metal connection between the end of the post and the cap.

The other part, B, is composed of the ordinary rounded or saucer-shaped disk or button back, having a tube, T, projecting from the center of its inner face. This tube is of a size and length suitable to receive within it the post P of the part A, and it is notched on opposite sides, at *n n*, to receive the ends of the double clamping-spring D, which latter is properly secured to the inner face of the button back.

It will be observed that the ends of the spring entering the notches on opposite sides of the tube, project into the opening of the tube near its bottom, so as to partially close it.

The tube is provided with a longitudinal web or flange, *w*, on one side, or, if desired, there may be two of these webs opposite each other on the tube, and they will serve the purpose of strengthening the tube, and increasing the security of its attachment to the disk, and at the same time operate as stops for the pins or spurs *s s* of the part A, as will more particularly appear below.

The operation of my improved button or stud is as follows: The parts A and B being separate, the tube or the post, as the case may

C. A. WOOD.

Sleeve or Collar Buttons.

No. 203,308. Patented May 7, 1878.

No. 289.
Pat. Office Gaz. p. 514
Krantzer.

Fig 1

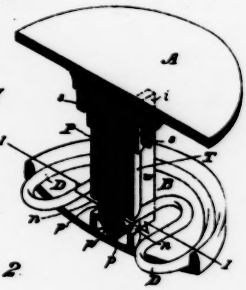


Fig 2

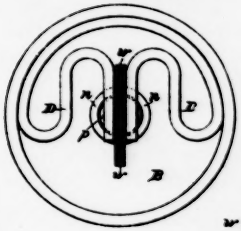


Fig 3.

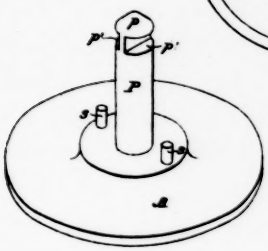
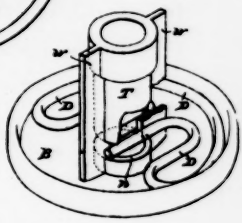


Fig 4.



WITNESSES

Wm A. Stinkle
Jos H. Brock

INVENTOR

Clarence A. Wood.

By his Attorneys.
Baldwin, Hopkins & Peyton

be, is inserted through the parts that are designed to be secured by the button. The post is then entered into the tube and the parts pressed together. On account of the fact that the ends of the double spring partly close the tube near its bottom, they form an obstruction to the complete entrance of the post; but the cap of the post being rounded or conical, as it is pressed into the tube it will cause the ends of the spring to spread, and the cap will pass them, when they will instantly contract or clamp together, and enter the recesses upon the opposite sides of the post, and thus hold the two parts of the button or stud firmly together.

When it is desired to separate these parts, the part A, which carries the post, is turned to the right or left until one or both of the pins or spurs *s s* strike one or both of the webs *w*. This rotary motion will cause the ends of the spring to spread apart, when the post can be readily withdrawn, and the two parts of the button thus disunited.

My button or stud can be made of different sizes and patterns, so as to be adapted to all the uses to which such articles are applicable.

Having thus described the construction and operation of my improved device, what I claim as my invention, and desire to secure by letters patent, is—

1. In a button or stud, the combination of the webbed or flanged tube T and the double spring D, adapted to work in opposite notches of the tube, for the purpose of holding the two parts of the button together, substantially as described.

2. In a button or stud, the combination of the flanged and notched tube, the double spring, and the notched and capped post and pins, substantially as described.

In testimony whereof I have hereunto subscribed my name.

CLARENCE A. WOOD.

Witnesses:

JAY C. HIGWELL.

HENRY E. COOK.

519–521 UNITED STATES PATENT OFFICE.

ALBERT B. KITTSON, of Johnstown, New York.

Improvement in Glove-fastenings.

Specification forming part of Letters Patent No. 206,883, dated August 13, 1878; application filed January 9, 1878.

To all whom it may concern:

Be it known that I, A. Briggs Kittson, of Johnstown, in the county of Fulton and State of New York, have invented certain new and useful improvements in fastenings for gloves; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters of reference marked thereon, which form a part of this specification.

Similar letters indicate similar parts in the several figures of said drawing.

My invention relates to fastening devices for gloves; and consists in certain improvements in the construction of the same, as hereinafter shown and described.

Certain fastening devices have heretofore been used for various purposes, which have a flaring knob or button and a converging recess to receive and hold it; but my improvements consist in the peculiar construction of the fastening device, as hereinafter stated and shown.

In the accompanying drawing—

(Here follows diagram marked p. 518.)

—forming part of this specification, figure 1 represents my improved fastening attached to a glove. Fig. 2 represents the two parts forming the fastening detached. Fig. 3 is a cross-section through the stem and recess in plate. Fig. 4 shows a modification in the construction of my device, the tongue being formed hollow or curve-shaped.

In my construction the fastening is made in two parts, designated, respectively, A and B in the drawing, the part A consisting of a plate formed with a tongue or stem, *a*, projecting laterally therefrom, as seen in the drawing. The stem *a* enlarges gradually in width from the plate A toward its outward extremity, is made somewhat thicker than the plate, and has its edges beveled. The part B is also a plate, formed with a recess, *b*, along its central part, conforming to the tongue or stem *a* on the plate A, so that when the plates A and B are brought together the stem *a* may be laid in the recess *b* in the plate B, when, by a slight movement of the parts A and B in opposite directions, the fastening is effected and the parts locked together.

A. B. KITTSON.
Glove-Fastening.

No. 206,883. Patented Aug. 13, 1878.

No. 289.
B. & S. Fastener Co
v.
Kraetzer. } p. 518.

Fig. 1.

Fig. 2.

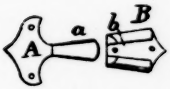
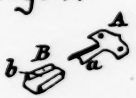


Fig. 3.

Fig. 4.



Witnesses:
W. Burris
H. A. Daniels.

Inventor:
A. Briggs Kittson.
By Lothrop and Kittson
Attorneys.

The plates A and B are each secured to the glove near the wrist by means of a small plate placed against the inner side of the glove and riveted to the outer plate.

When it is desired to unfasten the device the plates A and B are brought together, moving the tongue *a* slightly back, when it may be lifted from the recess *b*, and the unfastening is readily effected.

I am aware of the patent No. 149,473, issued to one Halsey, April 7, 1874, and do not claim the device shown in such patent.

Having described my invention, I claim—

In a glove-fastening, the plate A, adapted to be fastened to a glove, and provided with a flaring or wedge-shaped stem, *a*, with beveled edges, in combination with plate B, having a groove or recess, *b*, conforming to the stem *a*, substantially as and for the purposes described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ALFRED BRIGGS KITTSON.

Witnesses:

F. T. KITTSON.

C. P. BELLOWS.

523–525 UNITED STATES PATENT OFFICE.

WELLINGTON P. DOLLOFF, of Providence, Rhode Island.

Improvement in Collar and Sleeve Buttons.

Specification forming part of Letters Patent No. 210,017, dated November 19, 1878; application filed July 27, 1878.

To all whom it may concern:

Be it known that I, Wellington P. Dolloff, of Providence, State of Rhode Island, have invented a new and valuable improvement in collar and sleeve buttons; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

(Here follows diagram marked p. 522.)

Figure 1 of the drawing is a representation of a central longitudinal section of my improved button. Figs. 2, 3, and 4 are details.

This invention has relation to improvements in collar and sleeve buttons; and the nature of the invention consists in certain novel combinations of parts, whereby a sectional button of exceptional excellence is produced, as will be hereinafter more fully set forth.

In the annexed drawings, the letter A indicates the face of the button, having a tubular post, *a*, of suitable dimensions. Within this post is rigidly secured a forked spring-griper, composed of two arms, *i i*, united preferably at their inner ends, and terminating at their free ends in angular jaws *c*. These arms extend nearly to the end of post *a*, and are allowed to separate, under circumstances hereinafter set forth, by the chamber *b'* at opposite sides of the post. These chambers and post form together a body of oblong form, and, being introduced into a button-hole, serve to prevent the button from turning, thus when a figure is used on the face-plate, keeping it upright instead of sidewise or upside down.

The face-plate B is of larger size than the back, and carries a solid post, *b*, having at or near its junction with said plate an annular groove, *g*. From this grove the post gradually thickens up to a point about midway of its length, when it tapers off to a rounded end, *h*. This post, in putting the parts of the button together, is thrust into post *a* between the arms *i* of the griper, causing them to gradually separate until the angular jaws *c* drop into the groove *g*, when the reaction of the said arms causes the jaws to bind upon the post *b* in the groove aforesaid, requiring considerable force to separate them. This force, however, being applied, the swell *s* of the solid post causes the arms *i* to separate and allows the parts of the button to be disconnected.

W. P. DOLLOFF.
Collar and Sleeve Button

No. 210,017. Patented Nov. 19, 1878.

Fig. 1.

Fig. 2.

Fig. 3.

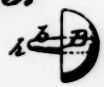


Fig. 4.

No. 289.
[illegible] Co. } p. 522
v.
Kraetzer.

WITNESSES
Wallace Anderson.
F. J. Masi.

INVENTOR
Wellington P. Dolloff.
by E. W. Anderson
ATTORNEY

What I claim as new, and desire to secure by letters patent, is—

In a sectional collar or sleeve button, the combination, with a back plate, A, having tubular post *a* and recesses *b'*, and the spring-griper *i i*, having angular jaws *c*, inside of said post, of a face-plate, B, having solid post *b*, provided with a groove, *g*, near its base, a swell, *s*, outside of said groove, and a rounded tapering end, *h*, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WELLINGTON P. DOLLOFF.

Witnesses:

JOHN C. PURKIS.
GILMAN E. JOPP.

527 UNITED STATES PATENT OFFICE.

LUCIAN HILL, of North Brookfield, assignor to Theodore C. Bates and David H. Fanning, of Worcester, Massachusetts.

Corset-steel Fastening.

Specification forming part of Letters Patent No. 225,375, dated March 9, 1880. Application filed December 20, 1879.

To all whom it may concern:

Be it known that I, Lucian Hill, of North Brookfield, county of Worcester, State of Massachusetts, have invented an improvement in corset-steel fastenings, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to fastenings for corset-steels, and is an improvement in the class of fastenings shown in patent to Hill, dated December 9, 1879.

In this invention I combine with the usual fastening eye-plate commonly applied to one of the steels a sheet-metal hook adapted to be struck by the usual stud connected with the other steel as the two steels at the front of the corset joined by the eye-plate and stud move slightly apart. This sheet-metal hook has a nose, which, when it is struck by the stud in its outward movement, causes the hook to yield laterally to the direction of movement of the stud, and as soon as the stud passes the said nose the hook moves back to its normal position and checks the backward movement of the stud into the large part of the eye-plate until the stress of the hook is again overcome.

In the patent referred to the fastening was made of wire; but in this my invention the fastening device is made of thin sheet metal, and an extra rivet by which to attach the fastening device to the steel is not needed.

My invention consists in the combination, with a fastening eye piece or plate, of a sheet-metal hook having a nose adapted to extend into or across the path of movement of the stud which enters the eye-piece, the said hook yielding laterally to the length of the eye in the eye-plate to permit the passage of the stud, and preventing its return until the stress of the hook is again overcome by forcing the stud backward past it.

The sheet-metal fastening may be made stiffer than the wire fastening, and may be struck out by a die at very small cost.

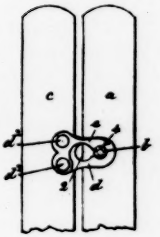
(Here follows diagram marked p. 526.)

Figure 1 represents, in front view, a portion of the two steels, with the usual hook and eye-plate, my improved fastening being applied thereto; Fig. 2, a modified form, in which the fastening or hook part is made as an integral part of the eye-plate; Fig. 3, a modification, showing a fastening with two hooks; Fig. 4, a modi-

L. HILL.
Corset-Steel Fastening.

No. 225,375. Patented Mar. 9, 1880.

Fig. 1.



No. 289.
B. & S. Fastener
Company.
Knaetgen.
p. 526

Fig. 2.

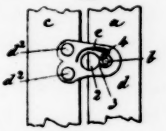


Fig. 3.

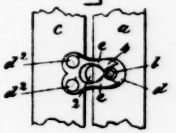


Fig. 4.

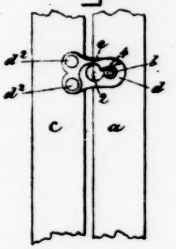


Fig. 5. Fig. 6.

Fig. 7.

Witnesses.
L. F. Connor.
Jos. O Sizemore

Inventor.
Lucian Hill
by Crosby & Gregory, Attys

fication in which the hook has several nose-like projections instead of one; and Figs. 5, 6, and 7 are details of the eye-plate and sheet-metal fastening separate from the steels.

The steel *a* and stud *b* and steel *c* may be of any usual kind.

The eye-plate *d*, attached to the steel *c* by the usual two rivets d^2 d^2, has an eye part, 2, to receive the head of the stud *b*, and leading from the said eye 2 toward the outer end of the eye-plate is a slot, 3, along which the shank of the stud *b* traverses after the same has been inserted through the eye 2.

To prevent the unhooking of the eye-plate from the stud, except by considerable force, and thereby to prevent accidental unhooking, is the aim of my invention. This I accomplish by combining with the said eye-plate a sheet-metal fastening, *e*, shown as a hook having a nose, 4, the said nose being properly beveled, and in its normal condition standing across the slot 3, or forming an impediment therein, against which the shank of the stud strikes when being moved to the end of the slot most remote from that steel to which the said eye-plate is attached, the stud occupying a position at that end of the said slot when the corset is fastened and distended.

The stud in its outward movement strikes the said nose and the fastening is sprung back, the stress of the spring metal being overcome, and having passed the said nose the latter springs back, occupying a position in the said slot at the rear of the stud *b*, where it acts as an impediment to the return of the stud into the eye 2. This sheet-metal fastening yields in a direction laterally to the movement of the stud along the slot 3.

In Fig. 1 the sheet-metal fastening is placed above the eye-plate, and is confined in that position by the same rivets which attach the said eye-plate to the steel.

If desired, the fastening may have two arms, as in Fig. 3, instead of one, as in Fig. 1.

Instead of providing the fastening with one nose, 4, as in Fig. 1, it may have several, as in Fig. 4, and so, also, it is obvious that the eye-plate, made a little larger than usual, may
528 & 529 be cut, as in Fig. 2, to form the fastening as an integral part of said eye-plate.

I claim—

In a corset-steel fastening, the eye-plate provided with an eye, 2, and a slot, 3, leading therefrom, combined with a connected sheet-metal hook having a nose to spring laterally across the slot 3 and impede the return of the stud from said slot, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LUCIAN HILL.

Witnesses:
BENJ. L. SAMPSON.
E. R. FISKE.

531–533 UNITED STATES PATENT OFFICE.

LUCIAN HILL, of North Brookfield, assignor to T. C. Bates, of same place, and D. H. Fanning, of Worcester, Massachusetts.

Improvement in Corset-steel Fastenings.

Specification forming part of Letters Patent No. 222,400, dated December 9, 1879; application filed September 24, 1879.

To all whom it may concern:

Be it known that I, Lucian Hill, of North Brookfield, county of Worcester, State of Massachusetts, have invented an improvement in corset-steel fastenings, of which the following description, in connection with the accompanying drawings, is a specification.

This invention relates to improvements in corset-steel fastenings, whereby the eye and hook or stud parts of the steel may be held together, and the accidental unhooking of the steels be prevented.

This invention is intended to be an improvement on the invention shown in United States letters patent No. 218,386, dated August 12, 1879, wherein a yielding plate-spring was shown as adapted to engage the stud or hook below its head.

In this my invention I employ a fastening device composed of a bifurcated or jaw-like or wire spring attached to that half of the set of steels carrying the usual eye part, the said fastening being so shaped as to permit the head of the usual hook or stud to be passed inward through the larger part of the opening for it in the usual eye, after which the stud, in moving to the smaller part of the said eye, crowds the said fastening aside, and on the stud reaching the end of the said eye the said fastening springs back to its normal position and acts as a stop against accidental return motion of the said stud in the slot of the said eye.

(Here follows diagram marked p. 530.)

Figure 1 represents, in perspective, a pair of corset-steels of usual construction provided with my invention; Fig. 2, a top view and section of the eye and connected expanding fastening and steel; and Figs. 3 and 4, modifications, wherein the wire arms or springs of the fastener are not crossed.

The steels *a b* and the eye *c* and hook or stud *d* are and may be of usual construction. Upon the steel *a*, near the eye *c*, and so as to extend along the side of slot *e* therein, I have secured, in this instance by a rivet, *f*, the fastening device, herein shown as a wire bent, as at 2 3, the bend 3, near the free ends of the wire, terminating above the slot near its outer end, or so near thereto as to leave a space for the shank of the hook or stud *d*.

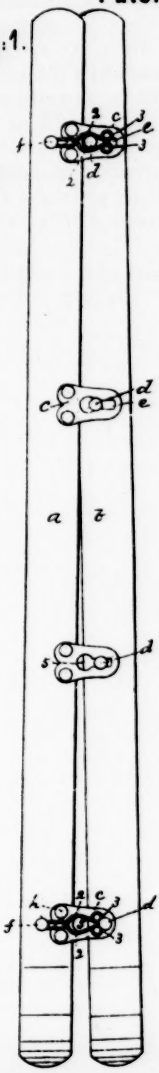
The recess formed between the bends 3 permits the passage of the hook or stud *d* through the enlarged part 5 of the eye, and the stud, as it is moved along the said slot from the position shown at top to

L. HILL.

Corset-Steel Fastening.

No. 222,400. Patented Dec. 9, 1879.

Fig: 1.



No. 289.
B. & S. Fastener
Company.
v. } p. 530
Kraetzer

Fig: 2.

Fig: 3.

Fig: 4.

Witnesses.
A. Hammond
Jos. P. Livermore

Inventor.
Lucian Hill
by Crosby & Gregory Attys.

the position shown at bottom of Fig. 1, acts upon the bent portion 3 of the fastening and crowds it back; but the spring arm or wire so crowded outward flies back as the stud *d* passes beyond 3, and the said portions 3 of the fastening then act as stops to prevent the accidental backward movement of the said stud along the said slot.

The shape of this expanding fastening may be variously modified without departing from my invention.

I do not desire to limit my invention to the exact means shown for attaching the expanding springs to the steel. It is obvious that the wire might be bent about the shanks of the rivets *h*, which attach the eye-piece to the steel, as in Fig. 4.

I claim—

In a corset-fastening a spring-fastening device composed of wire bent to spring laterally across the opening in the usual eye, to operate upon the stud, substantially in the manner shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LUCIAN HILL.

Witnesses:

CHAS. E. JENKS.

CHAS. PEPPER.

535–537 UNITED STATES PATENT OFFICE.

WELLINGTON P. DOLLOFF, of Providence, Rhode Island, assignor to Orrin C. Devereaux, of same place.

Separable Button and Stud.

Specification forming part of Letters Patent No. 230,115, dated July 20, 1880. Application filed May 27, 1880. (Model.)

To all whom it may concern:

Be it known that I, Wellington P. Dolloff, of Providence, in the State of Rhode Island, have invented an improvement in separable buttons and studs, of which the following is a specification.

My invention relates to that class of separable buttons and studs where the two parts are held together by means of a spring friction-catch without pushers; and it consists in an improved construction and arrangement of the operating-spring.

(Here follows diagram marked p. 534.)

Figure 1 is a plan view of the stud. Fig. 2 shows a side elevation of the front of the stud with an attached solid post, and also a vertical section of the shoe and hollow post with the spring for securing the two parts of the stud to each other. Fig. 3 is a plan view of the inner side of the shoe. Fig. 4 is a side elevation and partial section of the front portion of the stud and the solid post. Fig. 5 is an elevation of the cup-formed plate and hollow post, forming a portion of the shoe of the stud. Fig. 6 is an edge view of the spring which serves to connect the two parts of the button. Fig. 7 is a plan view of the under side of the spring.

In the accompanying drawings, A is the front plate or portion of the stud, to which is firmly secured the solid post B, provided with a transverse groove, *b*, near its lower end. The plate C is struck up so as to form an inclosed chamber, *c*, at the base of the hollow post D, to receive the coiled-wire spring E, having its end *e* turned downward, so as to rest against the back plate or cap, F, of the shoe. The edge of the cap F is turned over the edge of the rim *c'* of the plate C, thus forming a closed chamber, *c*, for holding the spring E. The arm *e'* of the spring, which serves to catch into the notch *b* of the post B, is curved, so as to properly fit against the side of the grooved post B. The curved portion of the spring-arm *e'* is to be arranged so as to spring slightly within the range of the bore of the hollow post D, as shown in Fig. 3, so that upon the insertion of the solid grooved post B within the post D the curved arm *e'* of the spring E will spring back into the notch *b* of the solid post, thus securing the two parts of the stud. The arm *e'* of the spring is supported above the cap-plate F of the shoe by the lower coil, e^2, and by the turned-down end *e*, in order that the head *b'* of the solid post may pass below the spring-arm *e'*, so that the spring-arm may pass into the

(Model.)

W. P. DOLLOFF.

Separable Button and Stud.

No. 230,115. Patented July 20, 1880.

No. 289.
B. Rd Fastener Co.
N. Keatley.

Fig. 1.

Fig. 4.

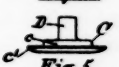


Fig. 5.

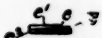


Fig. 6.

Fig. 7.

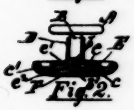


Fig. 2.

Fig. 3.

Witnesses.
H. W. Hubbard.
Joseph J. Schofield.

Inventor.
Wellington P. Dolloff

groove *b*, the head *b'* serving to press the spring-arm *e'* to one side as the post is forced downward.

When the two parts of the stud are thus locked together they may be separated by pulling sharply upon the front portion of the stud in the direction of the post.

Buttons and studs have been made having a plate extending above the cap F of the shoe, so as to form a closed chamber of the full dimensions of the two plates, for the purpose of holding the locking-spring; but by stamping a recess in the plate C, just sufficiently large to inclose the spring, I am enabled to use thinner stock to form the upper plate of the shoe and support the hollow post, than where the chamber occupies all of the space included within the rim of the cap F.

I claim as my invention—

1. In a separable button or stud, the coiled spring E, making more than one complete turn, with an arm, *e'*, having its end *e* turned downward in order to support the arm *e'* at its proper elevation against the downward thrust of the end of the solid post B when placing the two parts of the button together.

2. In a separable button or stud, the combination of the plate C, provided with the stamped recess *c* for holding the coiled locking-spring E, with an encircling-rim, *c'*, for the attachment of the cap F, and the hollow post D, for receiving and supporting the solid post B, substantially as described.

3. In a separable button or stud, the combination of the hollow post D, having an enlarged chamber, C, at its base, and having a coiled spring, E, constructed as shown and described, adapted to said chamber, with the cap F, solid grooved post B, and plate A, all substantially as described.

WELLINGTON P. DOLLOFF.

Witnesses:
HARMON S. BABCOCK.
JOSEPH J. SCHOLFIELD.

539 UNITED STATES PATENT OFFICE.

EDMUND WRIGHT, of Birmingham, England.

Fastener for Gloves.

Specification forming part of Letters Patent No. 233,060, dated October 5, 1880. Application filed June 11, 1880. (No model.) Patented in France June 9, 1879, and in England June 9, 1879.

To all whom it may concern:

Be it known that I, Edmund Wright, a subject of Great Britain, residing at Birmingham, in the county of Warwick, England, have invented certain new and useful improvements in fasteners for gloves, gaiters, purses, and other articles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to an improved fastener consisting of two parts, the one constructed of a cylindrical shell (or it may be a solid head) fitted to rotate within another similar shell, for the purpose of interlocking with a stud or pin constituting the other part of the fastener, whereby great strength, simplicity, and efficiency of action are secured.

In order that the invention may be more readily understood, I have illustrated it in the accompanying drawings, and will proceed to describe it with reference thereto.

The same letters correspond to like parts in each figure.

(Here follows diagram marked p. 538.)

Figure 1 is an elevation of the front portion or head of the fastener, and Figs. 2 and 3 are elevations of the two parts of which it is composed. Fig. 4 is a central vertical section of the entire fastener, and Fig. 5 a horizontal section thereof on line 1 1, Fig. 4.

A is a covered cylindrical shell, having by preference an oval cover (or it may be a solid head) fitted to revolve freely in an outer cylinder or shell, B, the two shells being connected together by the inner shell, A, being slotted or grooved for rather more than a quarter of its circumference on opposite sides, as seen at *a*, in which slots or grooves work nibs *b*, formed by piercing the outer cylinder, as shown, and bending down the nibs so formed into the groove *a*. These nibs thus answer the triple purpose of holding the inner shell in its place in the outer one, as stops to prevent the inner shell from turning more than the required distance, and as a brake to prevent the inner shell revolving too freely.

The outer shell is provided with a tubular neck, C, to receive the stud or pin D, (shown in Fig. 9,) and constituting the other portion

(No Model.)

E. WRIGHT.

Fastener for Gloves.

No. 233,060. Patented Oct. 5, 1880.

Fig. 1.

Fig. 2.

Fig. 3.

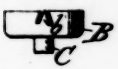


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

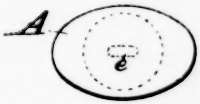


Fig. 8.

Fig. 9.

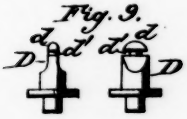


Fig. 10.

No. 289. B. & S. Fastener Co. } p. 538

Kraitzer.

Attest.

F. H. Schott.

A. R. Brown

Inventor.

Edmund Wright

of the fastener. This neck C is passed through one part of the garment on which it is intended to fasten. A washer, F, slightly larger than the cylinder B, is now passed over the neck C, which is then clinched or riveted over it, the material E being thereby embedded in the washer F, and thus firmly secured between it and the cylinder B.

Instead of clinching the neck C a thread may be cut thereon and a dish-shaped nut made use of.

The pin D is attached to the other part of the garment or article to be fastened in a similar manner.

The pin or stud D has a flat or oblong head, *d*, with notches *d'* just beneath, and the bottom of the inner shell or cylinder, A, has a corresponding oblong slot, *e*, as shown in Fig. 7, for the head *d* to pass through, and on turning the inner shell, A, one-quarter of a revolution the head *d* is held in the slot *e* by the sides of the latter engaging in the notches *d'*, as seen in Fig. 5.

The portions of the fastener being attached to the two parts of the article to be fastened, as above mentioned, if the shell A be turned until its slot *e* coincides in position with the head *d* of stud D, the former can be slipped freely onto the latter, and the two secured together by turning the shell A a quarter of a revolution, so that the slot *e* will be at right angles to the head *d*, as before mentioned.

The nibs *b*, working in the grooves *a*, limit the rotation of the head A and prevent it turning too easily.

Fig. 6 shows a vertical section on line 2 2, Fig. 8, which shows a horizontal section on line 3 3, Fig. 6, of a similar arrangement applied to another form of button in which the motion of the inner shell is limited by the nibs, as before described, while the two parts of the fastener are locked together by a spring, F', engaging with a notch, *d'*, at one side of the stud D', which in this case is of cylindrical form with a conical point, as shown in Fig. 10, the aperture *e'* in the bottom of the inner shell, A, Fig. 8, being likewise circular to allow of it rotating on the stud D'.

540 & 541 The spring is preferably of the S form shown, its two ends having upwardly turned lugs *f f*, which enter holes in the bottom of the shell A. The middle portion of the spring lies partly across the aperture *e'*, as shown, so that when the stud D' is inserted the spring will be pushed to one side by the conical point of the stud, and afterward fall into the notch *d''*, when the inner shell, A, is turned round to bring the spring opposite said notch.

The motion of the inner shell is limited by the nibs *b*, as before, except that in this case it should be about one-third of a revolution. On turning it the reverse way the spring leaves the notch and bears against the plain part of the stud, which is then free to be withdrawn.

The top of the shell A may be plain or set with jewels or other ornaments, as desired.

Having described my invention, what I claim as new, and desire to secure by letters patent, is—

1. In a button-fastener, the inwardly-turned nibs *b*, formed in the

outer shell of the button, and arranged to work in slots in an inner shell, whereby the inner shell is retained within the outer one, and its movement therein limited and regulated, substantially as shown and described.

2. In a button-fastener, the combination of the inner shell, A, having slots *a e*, the outer shell, B, having nibs *b* and tubular neck C, the washer F, and the stud D, provided with a flat or oblong head, *d*, and notches *d'*, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

EDMUND WRIGHT.

Witnesses:
A. R. BROWN.
F. H. SCHOTT.

D. ESSEX.

Corset Clasp.

No. 235,144. Patented Dec. 7, 1880.

Fig 1.

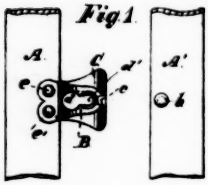


Fig. 2.

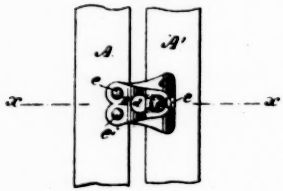
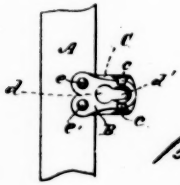


Fig. 3.

Fig. 4.



No. 284.
B. & S. Fastener Co.
v.
Kratzer.
p. 542.

Witnesses:
Henry Eichling
M. F. Clifton

Inventor:
David Essex Jr.
John Franas Meyer,
Atty.

543–545 UNITED STATES PATENT OFFICE.

DAVID ESSEX, of Corona, New Jersey.

Corset-clasp.

Specification forming part of Letters Patent No. 235,144, dated December 7, 1880. Application filed February 25, 1880.

To all whom it may concern:

Be it known that I, David Essex, of Corona, Bergen county, State of New Jersey, have invented an improved corset-steel clasp or fastening, of which the following is a specification.

The object of my invention is to present a corset-fastening which will not become accidentally disengaged. This I accomplish by combining with the eye-plate a flat spring, which by its tension prevents the stud when engaged in the eye-plate from becoming disengaged.

My improvement is shown in the accompanying drawings, in which—

(Here follows diagram marked p. 542.)

Figure 1 is a plan view, showing a portion of a pair of corset-steels provided with my improved clasp, which is disengaged. Fig. 2 shows the same engaged. Fig. 3 is a sectional view of Fig. 2 at *x x*. Fig. 4 is a plan view of a portion of a corset-steel provided with my improved plate and spring.

In the several figures like letters indicate like parts.

A A′ are portions of two corset-steels. B is my improved eye-plate. C is the spring provided with the lip *c*, which is designed to catch upon the eye-plate and to keep the spring in position. This lip may catch anywhere upon the front or side of the eye-plate, as shown at *c c* in Figs. 3 4.

e e′ indicate the points at which the spring and eye-plate are riveted to the steel. *f* is the stud, provided with the head *b* and the shoulder *b′*, which is adapted to hold the stud in position upon the surface of the steel to which it is riveted.

The spring C is curved away from the eye-plate to secure the desired tension, and is provided with an opening to admit the passage of the stud.

The eye-plate B is provided with the curve or double curve, as shown, and with the openings *d d′*.

The object of this peculiar form of eye-plate is to carry the opening *d′*, the material surrounding which is depressed, as shown, away from the surface of the steel A′, and to allow the head *b* of the stud *f* to rest securely in the same.

The spring C and eye-plate B may both be riveted upon the surface of the steel, as shown in Fig. 3, upon opposite surfaces, and

thus serve to strengthen the same at the point at which it frequently breaks—to wit, across the line of the rivets.

To operate my clasp, place the spring and eye-plate in position so that the larger part, *d*, of the opening in the eye-plate falls over the head of the stud, the spring resting upon the steel A′; then bring to bear upon the spring-surface sufficient pressure to raise the head of the stud through the opening *d*; then draw the steels apart, and at the same time release the pressure, so that the head *b* of the stud falls into the opening *d*′, where it will remain securely locked.

The advantage of my improved clasp over the ordinary eye-plate and stud is that no ordinary or casual pressure upon the steels or any portion of them will serve to cause the same to become disengaged, as is the case with the ordinary clasp or fastening.

What I claim is—

1. The spring C, eye-plate B, stud *f*, and steels A A′, combined and arranged to operate substantially as and for the purposes set forth.

2. In a corset-fastening, the eye-plate B, as shown, and provided with the openings *d d*′, the material surrounding said opening *d*, being depressed, as described, adapted to operate in connection with the stud *f*, as set forth.

3. The spring C, provided with the lip *c*, adapted to catch upon the eye-plate B and lock the head *b* of the stud *f* in the opening *d*′, as set forth.

4. The eye-plate B and spring C, riveted upon opposite sides of the steel A, and adapted to strengthen the same.

DAVID ESSEX.

Witnesses:
JAMES J. LYONS.
HENRY EICHLING.

(No Model.)

E. LOEWENTHAL.

FASTENING FOR GLOVES.

No. 244,632. Patented July 19, 1881.

Fig1.

Fig3.

Fig2.

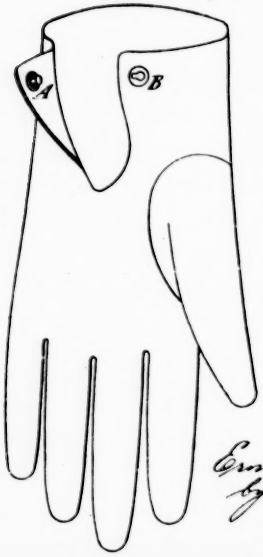
Fig4.

Fig5.

Fig6.

Fig7.

Fig8.



No. 289.
B. & S. Fastener
Company
v.
Kraitzer.
p. 546.

Witnesses
Robt. F. Hoyer
Ed. Glatzmayer

Inventor
Ernst Loewenthal
by his Attorneys
Brown & Brown

547–549 UNITED STATES PATENT OFFICE.

ERNST LOEWENTHAL, of Hamburg, Germany.

Fastening for Gloves.

Specification forming part of Letters Patent No. 244,632, dated July 19, 1881. Application filed June 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, Ernst Loewenthal, of Hamburg, in the Empire of Germany, have invented certain new and useful improvements in fastenings for gloves and other articles, of which the following is a specification.

My invention relates to fastenings composed of two parts adapted to be secured to the two sides of a glove or other article to be fastened, or one to each of two articles to be fastened together, one of said parts having a projecting headed pin or stud and the other a slot or opening comprising a hole for the insertion of the pin or stud and a narrower portion which fits the pin or stud below the head and prevents the withdrawal thereof.

The invention consists in a novel method of securing the said two parts of the fastening in the leather or other material of the glove or other article.

In the accompanying drawings—

(Here follows diagram marked p. 546.)

Figures 1 and 2 represent respectively a section and plan of one part of the fastening. Figs. 3 and 4 represent respectively a section and plan of the other part of the fastening. Figs. 5 and 6 represent sectional views of the two parts of the fastening and pieces of material in which they are secured. Fig. 7 represents a section of a portion of a fastening of modified form, and Fig. 8 represents a glove having the fastening applied thereto.

Similar letters of reference designate corresponding parts in all the figures.

A B designate the two parts of the fastening. The part A, in all the figures except Fig. 7, is represented as composed of a head or cap piece, *a*, of sheet metal, and an eyelet having an outwardly-projecting flange at one end, over which the edge of the cap-piece is folded, as most clearly shown in Fig. 1. The folded-over edge of the cap-piece *a* then forms a shoulder or flange, *b*, and the body of the eyelet forms a cylindric rim or flange, *c*. At the center of the part A, within the flange *c*, is a headed pin or stud, *d*, which projects from a bar or disk secured between the eyelet and the cap-piece *a* when they are fastened together, as previously described.

In Fig. 7 the part A, with the shoulder *b*, flange *c*, and pin or stud *d*, is represented as formed of a single piece of metal by casting.

The part B of the fastening is composed of a circular plate or disk, *e*, and an eyelet having at one end an outwardly-projecting flange, over which the edge of said disk is folded, thus forming a shoulder, *b*, while the body of the eyelet forms a cylindric rim or flange, *c*, as previously described with reference to the part A. In the disk or plate *e* is a hole or slot, *f*, comprising a larger portion, of sufficient size to admit the head of the pin or stud *d* and a smaller portion fitting the neck thereof, or the part below the head, and preventing its withdrawal.

In applying the parts of the fastening to two pieces of leather or other material, such as C, holes are first punched therein, which will just admit the flanges *c*, and, after being inserted, the edges of the said flanges are turned outward and pressed down or set, thus securely clamping the material C between such turned-over edges and the shoulders *b*.

In Fig. 8 I have shown the two parts of the fastening as applied to a glove, and although the invention is particularly applicable to gloves, it is also advantageous in fastening together two parts of any article of similar material, or two different articles.

I am aware that a fastening composed of two parts, one having a headed pin or stud and the other a key-hole slot for the reception of said pin or stud, is old, and therefore do not claim such fastening as of my invention.

What I claim as my invention, and desire to secure by letters patent, is—

1. The fastening composed of the two parts A and B, the first having the headed pin or stud *d* and the second the hole or slot *f*, and each having a shoulder, *b*, and a cylindric flange, *c*, adapted to be upset to secure it to the article, substantially as and for the purpose specified.

2. The fastening composed of the two parts A and B, the first having the headed pin or stud *d* and the second the hole or slot *f*, and each composed of an eyelet and a cap piece or plate, the edge of which is folded over the flange of the eyelet, thus forming on each of the said parts a shoulder, *b*, and a cylindric flange, *c*, substantially as described.

ERNST LOEWENTHAL.

Witnesses:
F. ENGEL.
F. CLAIRMONT.

(Model.)

J. WHITBY.

Glove Fastener.

No. 241,767. Patented May 17, 1881.

Fig. 1

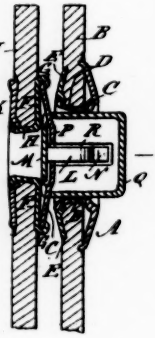


Fig. 2

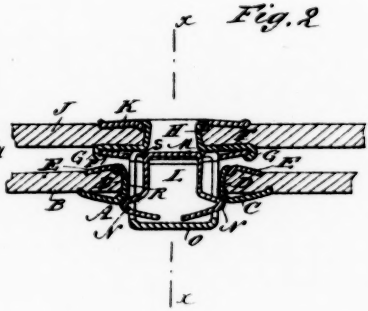


Fig. 3

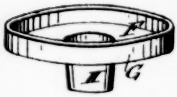


Fig. 4

Fig. 5

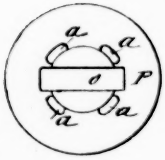


Fig. 6

No 289.
Bds. Fastener
Company
Kraitzer
p. 550

Fig. 7

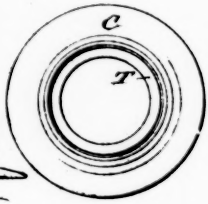
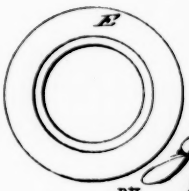


Fig. 8



WITNESSES:
C. Neveux
H. Bedgwick

INVENTOR:
J. Whitby
BY Munn & Co
ATTORNEYS.

551 UNITED STATES PATENT OFFICE.

JOSEPH WHITBY, of Yeovil, county of Somerset, England.

Glove-fastener.

Specification forming part of Letters Patent No. 241,767, dated May 17, 1881. Application filed March 31, 1881. (Model.) Patented in England April 27, 1880.

To all whom it may concern:

Be it known that I, Joseph Whitby, of Yeovil, in the county of Somerset, England, have invented a new and improved glove-fastener, of which the following is a full, clear, and exact description.

The object of my invention is to provide a glove-fastener which is durable and effective and does not tear the glove.

The invention consists in a hollow stud containing a spring which projects through slots in the sides of the stud and catches on a shoulder of an eyelet if the stud is passed through or into the eyelet, thus locking the two together, the eyelet and stud being fastened to the opposite lapels of the glove.

(Here follows diagram marked p. 550.)

In the accompanying drawings, figure 1 is a cross-sectional elevation of my improved glove-fastening on the line *x x*, Fig. 2. Fig. 2 is a cross-sectional elevation of the same on the line *y y*, Fig. 1. Fig. 3 is a perspective of plate for holding the stud-spring and fastening them to the glove. Fig. 4 is a perspective view of the cap for forming the slotted stud, showing it detached from the other parts. Fig. 5 is a plan view of the plate into which the tongues at the lower edge of the cap pass. Fig. 6 is a plan view of the spring. Fig. 7 is a plan view of the outer shouldered ring of the eyelet. Fig. 8 is a plan view of the inner ring of the eyelet.

Similar letters of reference indicate corresponding parts.

The eyelet A in the lapel B of the glove is formed of an annular plate, C, on the outside of the glove, and provided with collar D, which passes through the glove and a central aperture of the annular plate E on the inside of the glove. The outer edge of the collar D is bent over the edges of the central aperture of the plate E, for the purpose of uniting the plates C and E and attaching the eyelet to the lapel B of the glove, as shown in Figs. 1 and 2.

An annular plate, F, is provided with a flange, G, along the edge, and with a central collar, H, projecting in the direction opposite to that of the flange, and this plate is secured to the lapel J of the glove by passing the collar H through the glove and the aperture of an annular plate, K, on the inner side of the lapel, the edge of this tube being bent over the edges of the aperture of this plate K, as shown in Figs. 1 and 2.

A U-shaped spring, L, provided with a circular or square base-plate, M, and having its upper ends bowed outward, as shown at N N, rests upon the annular plate F, and is held on the same by a circular plate, P, provided with one transverse slot, O, for this spring L, and with a series of smaller slots, *a*, arranged in a circle, which plate P is fastened to the plate F by turning the flange G down over the edges of the plate P. A cap, Q, with longitudinal slots R R in the sides, and provided at the lower end with as many projections or tongues S S as there are slots *a a* in the plate P, is placed upon this plate P, over the spring L, in such a manner that these tongues or projections S S will pass into the slots *a a*. If the cap Q is driven down firmly, the tongues S S will spread and will hold the cap Q to the plate P.

The annular plate C is provided with a shoulder, T, at its junction with the collar D.

The spring L is firmly held in the cap Q, and the bowed portions N N project through the slots R R.

If the eyelet is passed over the stud or cap Q the projecting points of the spring are pressed inward, but snap out into the annular recess, forming the shoulder T, and thus hold the eyelet on the stud or cap Q. The eyelet can only be withdrawn if sufficient force is exerted to press the spring L inward.

A spiral spring with projecting ends may be used in place of the spring shown, or the stud may be made of springy material.

Finally, the springs may be provided in the eyelet and the recesses in the cap or stud, without deviating from my invention.

I have described the fastener as applied to gloves, but it is evident that it can be used on other articles.

Having thus described my invention, I claim as new, and desire to secure by letters patent—

1. In a glove-fastener, the combination, with the eye A, having an annular shoulder, T, of the slotted cap Q, and the spring L, with bowed ends N N contained therein, substantially as shown and described, and for the purpose set forth.

552 & 553 2. In a glove-fastener, the combination, with the annular plates C and E, forming an eyelet, A, in the glove-lapel B, of the longitudinally-slotted cap Q, the spring L, bowed at the upper end, and the plates P, F, and K, for holding the cap Q and spring L to the glove-lapel J, substantially as herein shown and described, and for the purpose set forth.

3. In a glove-fastener, the cap Q, constructed substantially as herein shown and described, with two longitudinal slots, R R, and with tongues S S at the lower end, in combination with the spring L and the plates P, F, and K, as set forth.

JOSEPH WHITBY.

Witnesses:

JOHN LUNDIE, JUN.,
Merchant, Weymouth.

THOMAS WATKINS,
Ship-broker, Weymouth.

J. BARCLAY.

Carriage-Curtain Fastener

No 69.959 Patented Oct 22. 1867.

No. 289.
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v.
Kraetzer.

Fig: 1.

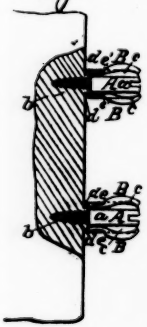


Fig: 2.

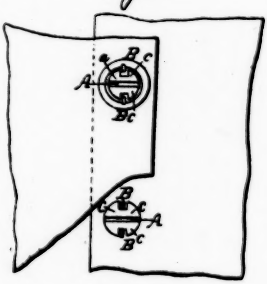


Fig: 3.

Witnesses.
Theo Trusche
J A Fraser

Inventor.
J. Barclay
per Munn & Co
Attorneys

555–557 UNITED STATES PATENT OFFICE.

JOHN BARCLAY, of Attleborough, Massachusetts, assignor to himself and Rufus D. Case, of New York, N. Y.

Letters Patent No. 69959, dated October 22, 1867.

Improvement in Carriage-knob.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, J. Barclay, of Attleborough, in the county of Bristol, and State of Massachusetts, have invented a new and improved carriage-knob; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

(Here follows diagram marked p. 554.)

Figure 1 represents a side view, partly in section, of my improved carriage-knob.

Figure 2 is an end view of the same.

Figure 3 is a perspective view of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to a new carriage-knob, which is so arranged that the spring jaws, by which the curtain is held, are made detachable from the pins by which they are secured to the carriage, so that when either part is destroyed or broken it can be replaced without losing the other part. The invention consists in securing two or more spring jaws to a ring, which is fitted over the shank of the pin so as to rest between the head of the same and the wood-work to which it is secured. The jaws fit into slots arranged in the head of the pin and project from the side of the pin to hold the curtain, but can be pressed into the slots to release the same.

A represents the pin of a carriage-knob, of which *a* is the head and *b* the shank. The latter may be provided with a screw-thread, as shown, or otherwise so arranged that it can be easily secured in the wood-work of the carriage. The head is provided with two or more straight slots *c'* extending from the shoulder formed by the head upon the shank toward the outer end of the head. B B are the spring jaws. Two or more of the same are fitted to a ring, *d*, as is clearly shown in Fig. 3. By fitting the shank of the pin A through the ring *d*, so that the jaws will be in line with the slots *c*, and by then securing the pin A in the wood-work, the parts will be connected for operation. The jaws are wider at their outer ends, forming shoulders *e e'*, as shown in Figs. 1 and 3. When the eyelet of

the curtain is pressed upon the end of the knob it forces the jaws into the slots *c*, the outer end of the jaws being rounded for that purpose, and as it slips over the shoulders *e* or *e'* it is firmly held on the knob. If the shoulders have sharp edges, as at *e* in Figs. 1 and 3, the curtain can only be released by compressing the jaws B, so that they fit into the slots C, and by their drawing the eyelet off. If the edges of the shoulders are chamfered, as at *e* in Fig. 1, the curtain can be drawn off by pulling it over the head of the pin without compressing the jaws by hand, although wind or the motion of the carriage will not have power enough to pull off the curtain. This device may also be used for other purposes besides as a carriage-knob.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

A carriage-knob, consisting of jaws B B, secured to a ring, *d*, which is fitted loosely over the shank of a pin, A, provided with slots C upon the sides of the head, all made and operating substantially as herein shown and described.

JOHN BARCLAY.

Witnesses:
WM. F. McNAMARA.
ALEX. F. ROBERTS.

No. 289
B. & L. Gaskin & Co. } p. 558.
Kraitzer.

L. C. Chase.

Clasp.

No. 91,308. Patented June 15, 1869.

Fig. 1.

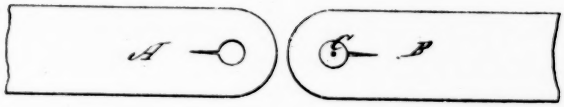


Fig. 2.

Witnesses:
Henry F. Chase
J. W. Burleigh

Inventor:
Lucius C. Chase

559-561 UNITED STATES PATENT OFFICE.

LUCIUS C. CHASE, of Boston, Massachusetts.

Letters Patent No. 91308; dated June 15, 1869.

Improved Fastening for Hand-reins.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, Lucius C. Chase, of Boston, in the county of Suffolk and State of Massachusetts, have invented an improved fastening, to be used in lieu of the ordinary buckle for securing the end of hand-reins together, and for other purposes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

(Here follows diagram marked p. 558.)

Figure 1 is a plan of the ends of a pair of reins having my improved fastening applied thereto.

Figure 2 is a section through the centre of the same when united together.

This invention relates to an improved fastening for the ends of reins, and consists in uniting them together by means of a knob or stud of peculiar construction, which is to be used in lieu of the ordinary buckle heretofore employed for this purpose.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings—

A B represent the ends of a pair of hand-reins, in each of which is formed a circular opening, and a slit, the opening and slit in the end of the rein B being for the reception of a stud, C, of metal or other suitable material, provided with a broad circular base, *a*, and a flange, *b*, at or near its centre, which serve to hold the stud in place within the end of the rein, the distance of the base *a* from the flange *b* being carefully made to correspond to the thickness of the rein, in order that the base *a* may be kept snugly in contact therewith, thereby avoiding any possibility of catching in the "dee," while the diameter of the flange *b* is such as to allow of the stud being entirely removed, as is necessary if it should be desired to apply a "rein-holder" to the rein. This could not be done if the stud was permanently secured to the rein B by rivets or otherwise, or if an ordinary buckle was used to secure the ends of the reins together.

The upper end *d*, of the stud, is of the form seen in Fig. 2, being

rounded and bevelled on both sides, so as to admit of its readily passing in and out of the opening and slit in the rein A, when it is desired to secure the ends of the reins together, as seen in Fig. 2, or separate them, as seen in Fig. 1.

Instead of the smaller end *d*, of the stud C, being of a circular form in cross-section, it may be made oblong, if preferred, and answer the same purpose. By the use of the above-described stud as a fastening, the reins may be easily untwisted without unfastening, by turning either one around the stud as a centre, a sufficient number of times to effect the desired end.

My improved method of fastening the ends of reins as described, prevents the necessity of cutting them away near the ends, as is usual where an ordinary buckle is used, and which tends to weaken the reins and render them more liable to bend and break at these points. This cutting away of the ends of the reins is necessary where a buckle is used as a fastening, so that the reins and buckle may be sufficiently narrow to pass easily through the "dee" of the saddle.

My improved method of fastening, as above described, allows the rein to be made of its full width to the extreme end, as seen in Fig. 1, thereby saving the time and labor of cutting away the leather, or folding it down, as is the case in the buff hand-rein or folded hand-rein where buckles are used. This method of fastening is not intended to be confined to reins, as it may be used to advantage in other parts of saddles or harness; for instance, in bridles, or wherever buckles are now used, it being a much cheaper and neater fastening than a buckle, and equally as secure and reliable.

Claim.

What I claim as my invention, and desire to secure by letters patent, is—

1. The within-described stud, when used as a substitute for a buckle in fastening reins and other parts of saddlery or harness, substantially as set forth.

2. Also, the stud C, in combination with the reins A B, when constructed substantially as described.

LUCIUS C. CHASE.

Witnesses:
HENRY F. CHASE.
J. H. BURLEIGH.

L. C. CURRAN.

BUTTON.

No. 176,932. Patented May 2, 1876.

Fig. 1

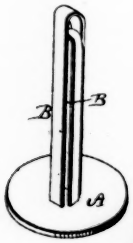
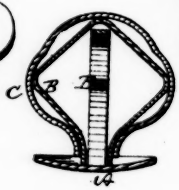


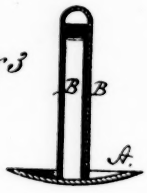
Fig. 2



No. 289.
B. & S. Fastener Company.
v.
Kratzer.
} p. 562

Fig. 4

Fig. 3



WITNESSES
F. L. Durand
A. L. Ewell.

INVENTOR
L. C. Curran
By Alexander & Dodge
Attorneys

563–565 UNITED STATES PATENT OFFICE.

LEWIS C. CURRAN, of Baltimore, Maryland.

Improvement in Buttons.

Specification forming part of Letters Patent No. 176,932, dated May 2, 1876. Application filed March 27, 1876.

To all whom it may concern:

Be it known that I, Lewis C. Curran, of Baltimore, in the county of Baltimore, and in the State of Maryland, have invented certain new and useful improvements in mode of constructing buttons; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction of a button applicable for clothing, shoes, and any other articles where buttons are needed, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which the various figures fully represent my invention.

(Here follows diagram marked p. 562.)

A represents a disk, made of metal, bone, or other suitable material, in the center of which are attached the ends of one or two metal loops, B B, doubled, as shown in Figs. 1 and 3. In Fig. 1 I show two of these loops, and in Fig. 4 I show simply one loop. Either of these will answer, but for heavy work two loops are better than one. C represents the button, which may be made of glass, metal, porcelain, or any other suitable material, and made hollow, with an aperture on the under side. This button may be made of any size and form desired. The metal loops B, when flat, as shown in Figs. 1 and 3, are passed through the cloth and inserted in the button C, when, by pressing the disk A and button C together, the two sides of each doubled loop B are spread outward within the button, and thus hold the parts firmly united together.

This invention is not only simple and cheap, and easily applied, but, when once fastened, the button cannot come loose. It remains fast as long as the goods to which the button is applied will last.

This button may be applied to any article where buttons are used, and for any purpose where other buttons may be applied.

Having thus fully described my invention, what I claim as new, and desire to secure by letters patent, is—

The combination of the disk A, one or more metal loops, B, and hollow button C, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of March, 1876. LEWIS C. CURRAN.

Witnesses:

H. A. HALL.

M. L. STOWELL.

567 UNITED STATES PATENT OFFICE.

Improvement in Buttons.

PAUL FRANÇOIS MAUVAS, of New York, N. Y.

Letters Patent No. 60217, dated December 4, 1866.

Specification.

To whom it may concern:

Be it known that I, Paul François Mauvas, of New York, in the county and State of New York, have invented certain new and useful improvements in buttons; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings.

The object of my invention is to provide a ready means whereby buttons may be secured to the cloth or other material with which they are used, without being sewn thereto as ordinarily done, so that they may be quickly and without trouble attached to or detached from the cloth; and its further object is to produce a buttoning device, by the employment of which the button-holes which are usually formed in garments may be dispensed with. To this end my invention consists in substituting for the loop, with which buttons are ordinarily provided, a straight shank, on whose end are studs which project out laterally from the shank, and which catch in grooves formed in a plate or disk, which, after the shank is inserted through the cloth, is fitted over its end, and is held in place by the said studs, thus securing the button to the cloth. In order to accomplish the second object of my invention, *i. e.*, the dispensing with the use of button-holes, I employ the following means: I take a flat plate of suitable shape, to the centre of which a metal shank, made as above described, is attached by any suitable means. This shank is inserted through the cloth at the point where the button-hole would ordinarily be formed, and has fitted over its end a perforated plate, which is grooved so as to receive the shank studs, and holds the device firmly to the cloth. The construction and arrangement of this removable holding plate and the shank are identical with those of the button first above mentioned. In order to connect this device with the button, I attach to the top of the upper plate of the device a straight shank or stem of suitable length, around the upper end of which a flange is formed. This stem is inserted up through the shank of the button above described, which shank when used in this connection is made tubular or hollow, and is then held tightly to the button by a spring mechanism, arranged, as hereinafter described, in the top of, or within the button, which catches under and around the flange on the stem, and holds it fast. In the accompanying drawings I have fully shown the manner in which my invention may be carried into effect.

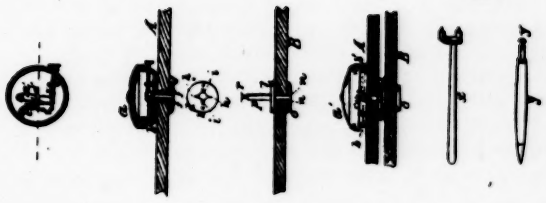
(Here follows diagram marked p. 566.)

P. F. Mauvas,
Button.

No 60.217. Patented Dec. 4, 1866.

No. 289.
Ord. Fastening &c } p. 566.
S. Kraitzer.

FIG. 1. FIG. 2. FIG. 3. FIG. 4. FIG. 5.



Paul Henri Mauvas
by A. Pollok
his atty

WITNESSES. H. Bailey
S. A. Duncan

Figure 2 is a vertical section of a button constructed in accordance with my invention It consists of the following parts: The top or "shell" *a*, the under plate *b*, technically termed the "collet," the shank *c*, and the holding plate *d*. The shank *c* is attached to the collet *b* by solder or other suitable means. It may be made of various lengths to suit the thickness of the material A with which it is used, and upon its end are formed laterally projecting studs, *f*. It may also be made solid, or it may be made tubular, as shown in the drawings. After the shank *c* has been inserted through the cloth A, a holding plate *d*, shown in Fig. 2, (bis,) is fitted over its end. This plate has a hole in its centre just large enough to fit over the shank *c*, while the radial slots *h* with which it is provided admit of its passing over the studs *f*. As soon as it clears the studs it is turned so as to remove the slots from the studs, the latter then fitting into radial grooves or notches, *i*, formed in the plate *d*, but not passing entirely through it, as is the case with the slots *h*. The studs thus hold the plate *d* to the shank, which is consequently prevented from being drawn out from the material A. To facilitate the adjusting or removal of the plate *d* to or from the shank, I employ a device, shown at *x*, Fig. 5, the forked end of which fits in the holes *k* of the plate. I am thus enabled to turn the plate with ease, either to secure it on the shank, or to remove it therefrom. The button thus constructed may be applied to, or removed from, the cloth with ease and despatch, and may be used either with or without the buttoning device shown in Fig. 3, which I am now about to describe, and which may be used to advantage instead of the ordinary button-hole, being applied to, or removed from, the cloth or other material with which it is used, without trouble. It consists of a circular plate, *l*, of about the size of the plate *d*, which has secured to its under side a shank, *m*, pivoted with studs, *n*, similar in shape and location to those on the shank *c* of the button in Fig. 2. This shank is inserted through the cloth B at the point where the button-hole would ordinarily be formed, and is then held in place by a plate, *o*, (similar in all respects to the plate *d*, Fig. 2,) which fits over its end and engages with the studs *n*. To the upper side of the plate *l* is fastened a stem *p* of suitable length, around the upper end of which a flange, *r*, is made, or a groove is cut. When this device is employed in place of a button-hole, the button, shown in Fig. 2, has a hollow or tubular shank, large enough to admit of the passage through it of the stem *p*, and on the upper side of the collet *b*, in the space between it and the top of the shell *a*, is arranged a spring mechanism, shown in Fig. 1. This mechanism consists of a locking piece *a'*, which is pivoted at one end to the collet *b*, and at the other to a rod or stem, *b'*, which is at right angles, or nearly so, to the locking piece, lying in the same horizontal plane, and extends out through the button, terminating in a little knob. The locking piece *a'* extends partially over the opening *d'* in the collet *b*, which forms the continuation of the tubular opening in the shank *c*. At this point the locking piece has formed in it a segmental-shaped recess, which just fits the neck of the stem *p*. Fig. 3, under the flange *r*. The piece *a'* is held in the position shown in

568 & 569

black lines, Fig. 1, by the pressure of a spring c', which bears against it. When it is required to fasten together the folds of the cloth A and B, to which the button and buttoning device, shown in Figs. 2 and 3, have been respectively attached as above described, the two folds are brought together so that the stem p of the buttoning device may be inserted up through the shank c of the button until the locking piece a', which has been forced back so as to allow the head of the stem p to pass up, will catch around the stem under the flange r, in which position it is held by the spring c, as shown plainly in Fig. 4. When it is desired to disconnect the folds A B, the knob of the rod b' is pressed upon, by means of which the resistance of the spring c' is overcome, and the locking piece a' is forced back from the opening d', as shown in red lines in Fig. 1, thus permitting the withdrawal of the stem p from the shank c, and the consequent separation of the folds A and B. At y, Fig. 5, is shown a needle, which may be used to facilitate the securing of the button, shown in Fig. 2, to the cloth. The flanged or grooved end y' of the needle is inserted up through the tubular shank c, where it is held by the locking mechanism in the top of the button, in the manner above described. The needle is then pushed through the cloth, carrying with it the shank c, whose end is also drawn through the cloth. The needle is then detached from the button by pressing back the locking piece a' in the manner above indicated, after which the plate d is applied to the end of the shank, as hereinbefore described. The button and buttoning device may be made of any material desired, such as gold, silver, ivory, &c.; and the button may be used either with the buttoning device or separately therefrom, in any connection in which ordinary buttons or studs and button-holes are used.

Having thus described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by letters patent, is as follows:

1. I claim the combination, with a button shank, provided at or near its end with one or more laterally projecting teeth or studs, of a metal or other plate, or equivalent device, slotted and perforated as herein described, so that it may be adjusted to, or removed from, said shank, as and for the purpose set forth.

2. I claim the combination, with a button provided with a tubular shank and locking mechanism as described, of the fastening or buttoning device herein described, the same consisting of a plate provided with a shank, secured to the cloth or other material in the manner above indicated, and with a stem grooved or flanged at its upper end, so as to engage with the locking mechanism of the button, substantially as herein shown and set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

MAUVAS (PAUL FRANÇOIS.)

Witnesses:

ALFD. DE GLAINTOR.

M. SAILER.

C. N. Nickerson.

Button.

No 83103. Patented Oct. 27. 1868.

No 287.
A & L Pratt & Co. vs. Pratt &c. p. 570.

Fig 6

Fig 1. Fig 2. Fig 3.

Fig 4.

Fig 5.

Witnesses
F. H. Moore
James Egan

Inventor
Chas. N. Nickerson by
Chas. F. Sleeper, atty.

571–573 UNITED STATES PATENT OFFICE.

CHARLES N. NICKERSON, of Gloucester, Massachusetts, assignor to himself and William Hodgkins 3d, of same place.

Letters Patent No. 83403, dated October 27, 1868.

Improvement in Buttons.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, Charles N. Nickerson, of Gloucester, in the county of Essex, and State of Massachusetts, have invented a new and useful improvement in buttons; and I do hereby declare that the following is a full, true, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

(Here follows diagram marked p. 570.)

Figures 1, 2, 3, and 4 are views of a patented button, and

Figures 5 and 6 are views of the same button, with my improvement attached.

My invention is an improvement upon the self-locking button of Frederic I. Palmer, of Springfield, Massachusetts, patented March 27, 1866.

The patented button is so constructed, that when it is placed upon a garment it can only be removed by destroying the button, or tearing the garment, and is unfit for further use: while my improvement provides a ready way of removing it, without injury to the button or the cloth.

In the said drawings—

A represents the stud.

B represents the button-form.

C represents a metallic spring, perforated, as shown.

When the stud A is put through the cloth into the button, the spring C engages it, and holds the parts firmly together, by catching in the notched portion of the stud, and it is evident that they cannot be separated, without destroying the button, when made as described in Palmer's patent.

In my improved button, I use the same spring and stud, but make the stud with a smaller head, and surround it with a sleeve, E, flanged, to give the necessary hold upon the cloth. A portion of the sleeve enters with the stud into the button-head, and the spring C catches in the notch of the stud A, as in the patent. To remove the stud, all that is necessary is to press the sleeve forcibly down upon the spring, which will separate its parts, and free them from their hold of the stud.

For this purpose I commonly use pliers, made with a split in one of the jaws, to clear the head of the stud and bring its force upon the sleeve, and with a depression of the other jaw to receive the projection on the face of the button.

Having thus described my invention,

What I claim as new, and desire to secure by letters patent, is—

The combination of the sleeve E, stud A, and spring C, substantially as described.

CHARLES N. NICKERSON.

Witnesses:

DAVID W. LOW.
F. R. MARCHANT.

C. A. NEWTON.

Improvement in Sleeve Buttons or Studs.

117,916. Patented August 8, 1871.

Fig 1

Fig 2

Fig 3

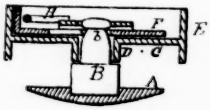
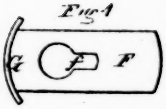


Fig 4



No. 289.
B. & S. Knitting Co. } 1. 574
Krantzer.

Witnesses
J. B. Curtis
J. M. Stynes.

Inventor
C. A. Newton
Chapman Thomas &
Attys.

575–577 117,916.

UNITED STATES PATENT OFFICE.

CHARLES A. NEWTON, of Providence, Rhode Island.

Improvement in Buttons or Studs.

Specification forming part of Letters Patent No. 117,916, dated August 8, 1871.

To all whom it may concern:

Be it known that I, Charles A. Newton, of Providence, in the county of Providence, and State of Rhode Island, have invented a new and valuable improvement in sleeve-buttons; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

(Here follows diagram marked p. 574.)

Figure 1 of the drawing is a plan view of my invention with face removed. Fig. 2 is a side elevation. Fig. 3 is a vertical section. Fig. 4 is a face view of slide, hereinafter described.

This invention has relation to an improvement in buttons or studs; and consists in the hereinafter-described construction and novel arrangement of devices whereby the head and back part of the button or stud may be separated and locked together for greater convenience in their use.

In the accompanying drawing illustrating this invention, A represents the back plate of the button, holding the shank B, around the top of which is formed a groove, *b*. C designates a circular or other shaped plate, with a central opening, encircled by a flange projection, D, which rests in the groove *b*. E represents a rim which surrounds the plate C. F represents a slide, having a slotted eye, *f*, through which the grooved end of the shank passes. G, a lip on the end of said slide. H, a spring which tends to keep the slide F back by pressing against the lip G. L, an opening in the rim E into which the thumb-nail may be inserted to release the slide from the shank. J, the stone, jewel, or other ornament which forms the front of the button. The slotted part of the eye *f* clasps the shank when the head and back part of the button are locked together, and they may be separated by pressing the slide until the wider part of the eye reaches the shank. K represents a plate which guides the slide F.

What I claim as my invention, and desire to secure by letters patent, is—

The button or stud herein described, consisting of the head C pro-

vided with a nail-slot in the rim and the spring H, slide F having the pear-shaped slot *f*, and of the back A provided with the grooved stem B, combined, arranged, and operated substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CHARLES A. NEWTON.

Witnesses:

EDWARD McCABE.
ASA C. NEWTON.

S. S. Ritter,

Button.

No. 47661. Patented. May. 9. 1865.

Fig 1.

Fig 2.

Fig. 3.

No. 289.
P. & S. Firestone Co. } pp. 578
N. Kratzer.

Witnesses
C. D. Smith
Chas. A. B. Stanwood

S. S. Ritter
By Munn & Co
Attorneys

579–581 UNITED STATES PATENT OFFICE.

SAMUEL S. RITTER, of Philadelphia, Pennsylvania.

Improvement in Studs and Buttons.

Specification forming part of Letters Patent No. 47661, dated May 9, 1865.

To all whom it may concern:

Be it known that I, Samuel S. Ritter, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful improvement in studs and buttons; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings making part of this specification, in which—

(Here follows diagram marked p. 578.)

Figure 1 is a central section of a stud, illustrating my invention. Figs. 2 and 3 are detached views of the two parts in which the stud is formed.

Similar letters of reference indicate corresponding parts in the two figures.

This invention relates to a stud whose two disks are capable of being detached and coupled, so that in putting it into the bosom or sleeve it will only be necessary to insert the stem or shank through the button-hole, said shank being joined to one of the disks, and the stud having a provision for the application of the other after being passed through the button-hole.

The improvement consists in a novel contrivance for coupling and uncoupling the two parts or disks of the stud.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

In the accompanying drawings A A′ represent the two disks or parts of the stud or button, and B the coupling-shank, which latter is permanently joined or secured to the disk A′. In the shank B are formed notches or grooves *b b*, which may be occupied by springs *a′ a′* when the shank is inserted into the sleeve *a* as far as the disk A will permit it to go. If the springs *a′ a′* do not enter the notches *b b* as soon as the shank is inserted, a slight turn will cause them to do so, and when the springs are in the notches the two parts A A′ of the stud or button are securely locked together. The turning of either of the disks A or A′ will also cause the periphery of the shank B to spread the springs, and this turning will change the relative positions of the parts in such a manner that the springs *a′*, instead of occupying the notches *b b*, may be made to rest upon the adjacent part of the periphery of the shank B, and when the parts are thus

situated the shank B can be withdrawn from the sleeve *a* and the two disks separated.

The simplicity of this invention renders a more detailed description unnecessary.

It is apparent that one spring may be used instead of two, and this modification may be made without departing from the essential principle of my invention.

Having thus described my invention, what I claim as new, and desire to secure by letters patent, is—

Providing a stud or button with a spring or springs, *a'*, and a notch or notches, *b*, permitting the two disks A A' to be coupled and uncoupled at will, substantially as and for the purpose explained.

To the above specification of my improvement in buttons I have signed my hand this 12th day of January, 1865.

S. S. RITTER.

Witnesses:

EDWARD H. KNIGHT.
CHARLES D. SMITH.

C. Robitaille.

Button.

No. 54071. Patented Apr. 17. 1866

Fig. 1.

Fig. 2.

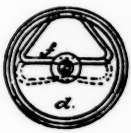


Fig. 3.

Fig. 4.

no. 289.
B. & S. Fastener Co
v.
Kratzer.
} p. 582.

Witnesses:
Geo. D. Wadsworth
Chas. H. Smith

Inventor:
Charles Robitaille

583-585 UNITED STATES PATENT OFFICE.

CHARLES ROBITAILLE, of Brooklyn, New York, assignor to Florian Dahis and Henry B. Voss, of same place.

Improvement in Buttons.

Specification forming part of Letters Patent No. 54071, dated April 17, 1866.

To all whom it may concern :

Be it known that I, Charles Robitaille, of Brooklyn, in the county of Kings and State of New York, have invented, made, and applied to use a certain new and useful improvement in fastenings for garments; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

(Here follows diagram marked p. 582.)

Figure 1 is a section of the button or fastening complete. Fig. 2 is a view of the back of the button. Fig. 3 is a view endwise of the perforator and its head, and Fig. 4 is an enlarged section at the neck or notches of the perforator.

The figures are larger than the usual size of fastening, and similar marks of reference denote the same parts.

My invention is an improvement upon that for which letters patent were granted, November 14, 1865, to Dahis and Voss as assignees of Florian Dahis.

My invention relates to the mode of forming and securing the spring in the button, whereby a much longer and more flexible spring can be made, and occupies less space than the spring in said patent and is less liable to injury. I also provide a peculiar character of notch or neck in the perforating-point, and teeth around the head of the perforator to take the cloth and prevent the same turning when the button-head is revolved to disconnect the parts.

In the drawings the letters of reference employed correspond with those on the said letters patent, and a reference is made to the same for a description of the general nature of said parts.

a is the head of the perforator *b*. *c* is the notch; *d*, the stud or button-head with the central hole, *e*, and *f* is the spring. This spring *f* is formed in a triangular shape, as seen in Fig. 2, and sits within a recess in the back of the button *d*, the central portion of the spring occupying a notch in the side of the projection containing the hole *e*. This form of spring occupies but little space, and is much longer than that in said patent. The ends of *f* might be folded back, as shown by dotted lines in Fig. 2, and be equally elastic.

The notch *c* is to be formed triangular, as in larger size in Fig. 4, so that the button-head and perforator can only be disconnected when turned, so that the spring rests on the angle opposite the por-

tion *c'* of the said notch, where the side of the perforator is removed, so that the spring *f* may draw off the said perforator *b*.

I make the head *a* of the perforator *b* concave, with teeth around its edge entering the surface of the cloth, when the parts are together, sufficiently to prevent said perforator turning when the button-head *d* may be turned for the disconnection of the parts. I prefer that these teeth be formed like saw-teeth, and half set in one direction and half in the other (see Fig. 3) to more effectually prevent the head *a* from turning.

What I claim, and desire to secure by letters patent, is—

1. The spring *f*, in the folded or triangular form shown, in combination with the projection in which is the hole *e*, for the purposes and as specified.

2. The notch *c*, in a triangular shape, with a portion of the side of the perforator removed, as at *c'*, for the purposes and as specified.

3. The teeth around the edge of the head *a* of the perforator *b*, as and for the purposes specified.

In witness whereof I have hereunto set my signature this 28th day of November, A. D. 1865.

CHARLES ROBITAILLE.

Witnesses:

GEO. D. WALKER.
CHAS. H. SMITH.

H. S. WING.

BUTTONS AND STUDS.

No. 187,442. Patented Feb. 13, 1877.

No. 289.
P. & S. Fastener Co.
v.
Kraetzer
} p. 586.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

WITNESSES
Edd. Stillingham
A. W. Bright

INVENTOR
Henry S. Wing.
By Leggett & Leggett.
ATTORNEYS.

587 UNITED STATES PATENT OFFICE.

HENRY S. WING, of Rochester, New York.

Improvement in Buttons or Studs.

Specification forming part of Letters Patent No. 187,442, dated February 13, 1877; application filed August 15, 1876.

To all whom it may concern:

Be it known that I, Henry S. Wing, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful improvements in studs or jewelry-buttons; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to studs, shirt and cuff buttons, and similar articles of dress-wear used for ornament, or as a means of fastening together different parts of articles of apparel.

(Here follows diagram marked p. 586.)

Referring to the drawings, Fig. 1 is an isometric view of a stud or jewelry-button constructed according to my improvement. Fig. 2 is a vertical section through the standard of the stud transversely to the spring-bars. Fig. 3 is a detail of the face and base-plates, respectively, disunited. Fig. 4 is a view of a modification of my invention.

A is the stud or button of any desired design or material having a standard, B, centrally supporting same from its under or reverse side, and either of same piece therewith or firmly fastened thereto. Its lower extremity is provided with a conical wedge-shaped head, *b*, or it may be of an oblong wedge-shaped construction. Just above this part *b* is a recess, *a*, channeled upon two opposite sides only of the stem, and thus constituting a semi-annular groove, which is of suitable construction to engage with the locking mechanism which secures the standard to the lower or base plate C. This latter plate is also of immaterial form or composing matter; but, preferably, I make it corresponding to the face-plate in size and material. It is provided with a central perforation, *c*, of size adapted to the head on the lower end of the standard, and it receives same flush with its lower surface.

A sleeve, or tubular stem, D, supporting the base-plate is built up about the aperture *c*, so as to extend upward from the base-plate as a continuation of the aperture in same, and is adapted to inclose the stem and give it lateral bearing. It may be of the same or of a different piece from the plate.

Extending across the interior of the base-plate, and a little raised

from its central plane, is the bridge E, through which the tubular stem D passes. Its supporting-standards E′ give journal-bearing to the two spring-bars F longitudinally located under the bridge, and passing through lateral slots *d* formed in the lower portion of the sleeve or tubular stem D. One of these standards E′ may be centrally recessed at *e*, to allow of one end of the springs being introduced freely into their bearings on either side of this recess, as shown in the modification drawing of Fig. 4. This construction I may use as desired, or I may confine myself to the construction shown as the main principle of my invention. By this modified form it will be seen that the springs may be readily introduced into their bearings and work freely therein, so that while they are securely retained in proper position they are yet capable of being easily removed, as may be desired or necessary. Thus upon accident to or breakage of one of the springs the parts may be removed and a new spring easily introduced in substitution thereof. These bars E are preferably of steel, but may be of any suitable composition, and are sufficiently elastic to snugly compress the groove with a binding hold upon the standard as they engage with said groove of the latter. To connect the two pieces, the upper and lower plates, the standard is introduced into the sleeve or tubular stem D, and by pressure the conical head *b* is forced in between the two springs, and as the lower end of the standard passes into the aperture of the base-plate the head of the latter overrides the spring-bars, and the bars sink into the recessed neck or groove *a*. This securely retains the two parts together, and they may be released by turning the face-plate or the base-plate a quarter revolution or thereabout, which disengages the spring from the groove and allows of the separation.

It is apparent that instead of pressing the standard strongly downward, so as to separate the spring bars by force of the head on same, the latter may be introduced lightly in between the springs, and then locked securely by a partial revolution by simply giving an oblong form to the lower extremity of the standard, whose less diameter is no greater than the open space between the springs, and whose diameter through the retaining grooves is greater than such space. This would still allow of a binding hold upon the standard when locked.

588 & 589

It will be observed that the head *a* of the standard is provided with inclines or wedge-shaped planes *a′* upon opposite sides of the head, and alternating with the grooved sides of same. These wedge-shaped planes cause the standard carrying the stud to be forced upward by the contracting tension of the spring-bars, as the latter tend to come in straight line upon being released from the binding-groove of the standard as the latter is turned in its tubular stem. By this reaction or outward rebound the stud is at once disengaged from the springs, and easily removed from the tubular stem, so that the two parts, the stud or face-plate and the lower or base-plate, are at once separated from one another by a mere partial turn.

Having fully described my invention, what I claim as new, and desire to secure by letters patent, is—

1. A stud or button fastening, consisting of a plate having a shank secured thereto, the latter constructed with two wedge-shaped faces, and the opposite and intermediate portions grooved, in combination with an under plate, which is provided with parallel spring-bars secured at both ends, substantially as and for the purpose specified.

2. In a stud or button fastening, the combination, with the cross-bar having parallel springs secured thereto, of a hollow standard suitably notched on opposite sides, whereby it is firmly secured to the cross-bar by means of the parallel springs, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

H. S. WING.

Witnesses:

F. O. McCLEARY.
A. W. BRIGHT.

591–593 125,502.

UNITED STATES PATENT OFFICE.

JAMES TAYNTON, of Port Jervis, New York, assignor of one-half his right to Z. G. Coykendall, of same place.

Improvement in Carriage-curtain Fasteners.

Specification forming part of Letters Patent No. 125,502, dated April 9, 1872.

Specification.

To all whom it may concern:

Be it known that I, James Taynton, (assignor to himself and Z. G. Coykendall,) of Port Jervis, in the county of Orange and State of New York, have invented certain new and useful improvements in knob curtain-fastenings for carriages, and for other purposes; and the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing making a part of this specification, in which—

(Here follows diagram marked p. 590.)

Figure 1 represents an outside view of a carriage-curtain, showing the various or modified forms of the fastenings as they are secured to the curtain. Fig. 2 shows an edge view of the same as attached to a frame or top of a vehicle. Figs. 3, 4, 5, and 6 show views of one mode of construction of my improvements in knob-fastenings. Figs. 7 and 8 show an under side and edge sectional view of another form or mode of construction. Fig. 9 shows another modification of the same. Figs. 10, 11, and 12 show outside, inside, and sectional views of another modification of the same. Figs. 13 and 14 show an under side and sectional view of still another mode of construction of my improved knob-fastening. Fig. 15 shows an improved knob or button for a carriage-curtain or other curtain-fastening. Fig. 16 shows a sectional edge view of a knob and plate fastening, having a hinged cap, B′, to cover over the fastening piece and knob.

My invention relates to knob-fastenings or clasps for securing carriage-curtains and curtains for various purposes, screens, and canvas coverings for trunks, tents, &c.; and it consists in the construction of the clasps and sliding forked plates and caps which cover over and embrace the knobs, in the manner hereinafter more fully described.

The curtain A has secured to it three modifications of my improvement—namely, the straight sliding forked plate *a*, as shown in Figs. 4, 5, 6, 7, and 8, also 11 and 12, and the right and left curved sliding fork plate *d*, as shown in Fig. 9.

Various other modifications, which produce the same result in the

JAMES TAYNTON.

Improvement in Carriage Curtain Fasteners.

No. 125,502. Patented April 9, 1872.

Fig. 1.

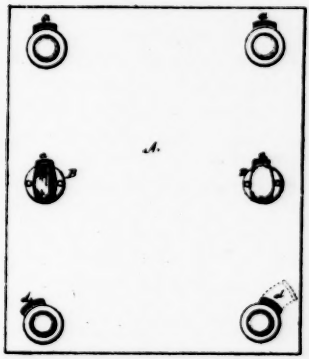


Fig. 2.

Ord. Feb. 28th '72. No. 590.

Fig. 3.

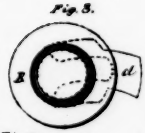


Fig. 5.

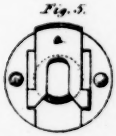


Fig. 7.

Fig. 9.

Fig. 4.

Fig. 6.

Fig. 8.

Fig. 10.

Fig. 11.

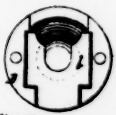


Fig. 13.

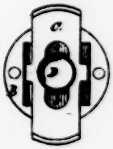


Fig. 15.

Fig. 12.

Fig. 14.

Witnesses.

C. A. Poole

J. H. Luther

Inventor

Geo. Taynton, Jr.

by his Att'y's Z. H. Boykin and all

By G. B. Woodruff Attorney of Record

same manner, may be made. Figs. 13 and 14 show a sliding plate, C, which has an elongated opening, *c c*, the central portion being large enough to admit the knob D, and may be slided either way to fasten to the knob E, which may be of the ordinary kind now in use, as seen in Figs. 8 and 12; or they may be my improved form of knob D, as seen in Fig. 15, having an annular groove, *f*, to receive the plate C. The caps B, which cover the knob and protect the fastening devices of all the modifications above described, are provided with projecting prongs *e e*, by which they are secured to the curtain A, or on other substances and places where it is desirable to use them.

Various other modes of construction have suggested themselves, such as having the outside cap B hinged to the plate *b'*, and a catch to hold it closed, so that it can be opened to operate a latch or slide, which is entirely incased out of sight, when the clasp case is closed, and others too numerous to mention, where the function performed would be precisely the same by substantially the same means—namely, the sliding forked plate or latch.

The advantages of the above-described knob-fasteners are, that the common knobs can be used, curtains can be easily attached and detached, will not become loose of themselves, are much more durable, and may be made highly ornamental.

What I claim is—

1. Knob-fastenings or clasps as constructed, the same being provided with movable or sliding forked plates to embrace the knobs and caps to cover over the same, substantially as and for the purposes herein shown and described.

2. I claim the knob D, with its annular groove *f* to receive a movable forked plate, *a*, *b*, *c*, or *d*, substantially as herein shown and set forth.

In testimony whereof I hereunto subscribe my name.

J. TAYNTON.

In the presence of—

J. B. WOODRUFF.
W. J. KETCHAM.

595–597 UNITED STATES PATENT OFFICE.

Improvement in Carriage-curtain Eyelet.

CHARLES W. ACKER, of Watertown, New York.

Letters Patent No. 60608, dated December 18, 1866.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern :

Be it known that I, Charles W. Acker, of Watertown, Jefferson county, State of New York, have invented a new and useful improvement in knob eyelet for fastening carriage curtains; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

(Here follows diagram marked p. 594.)

Figure 1 is an outside view of a portion of a carriage curtain with my improved eyelet attached.

Figure 2 is an inside view of the same, a portion of the inner plate being broken away to show the manner in which the gum-elastic plate is attached.

Figure 3 is a sectional view of the same taken through the line *x x*, Fig. 1.

Similar letters of reference indicate like parts.

My invention has for its object to furnish an improved eyelet for attaching carriage curtains to the knobs conveniently, easily, and quickly. And it consists in an improved eyelet formed by combining two metallic ring-plates and an interior gum-elastic plate with each other in the manner hereinafter more fully described.

A represents a portion of the curtain to which the eyelet is attached, and B represents the knob to which the curtain is to be secured; C is the outside plate of the eyelet, which is cut out of sheet metal and struck up into substantially the form shown in the drawing; that is to say, it should be struck up or have a circular projection formed on its outer side, and a corresponding circular groove on its inner side, to receive the overlapped edges of the curtain and interior gum-elastic plate. It is also formed with teeth or prongs upon its outer and inner edges, as shown in Figs. 1, 2, and 3. The inner plate, D, is made in the same general form as the outer one, C, except that it has no teeth or prongs formed upon its edges. The drawings represent the inner plate as having notches formed upon its outer edge to receive the teeth formed upon the outer edge of the plate C. This is not essential, but I prefer to make it so, as it gives a neater appearance to the completed eyelet. The interior gum-

C. W. ACKER.

Carriage-Curtain Fastening.

No. 60,608. Patented Dec. 18, 1866.

No. 289.
B. & S. Fastener Co.
S. Kraitzer.
4.594

Fig. 3.

Fig. 1.

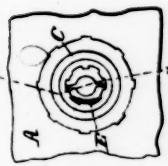
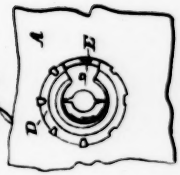


Fig. 2.



Witnesses.
Jas. A. Service
Wm Tyrwin

Inventor.
Chas W. Acker
per Munn & Co Attys

elastic plate E should be of such a size as to extend nearly to the outer edge of the grooves formed in the plates C and D, as shown in Fig. 3, and has a circular hole cut through it for the reception of the neck of the knob B. One or more slits should also be made in said plate E, extending from the central hole to near the inner edges of the plates C and D, to enable the head of the knob B to pass easily into and out of the eyelet. The gum-elastic plate E is secured to the outer plate, C, by turning the teeth or prongs formed around the inner edge of said plate C inward, and then passing them through and bending them down upon the gum-elastic plate E, as shown in Figs. 2 and 3. The inner plate, D, is not attached to the plates C and E until the eyelet is to be attached to the curtain. A hole is then cut in the curtain of such a size that its edge may slightly overlap the edge of the gum-elastic interior plate E. The teeth or prongs from around the outer edge of the plate C are bent down and passed through the curtain, the inner plate, D, is then applied to the inner side of the curtain, and the said teeth or prongs closed down upon it, as shown in Figs. 2 and 3, and the attachment of the eyelet to the curtain is completed.

I claim as new, and desire to secure by letters patent—

The toothed struck-up plate C and notched struck-up plate D, in combination with the slitted elastic plate E, constructed and applied substantially as described for the purpose specified.

The above specification of my invention signed by me this 17th day of July, 1866.

CHAS. W. ACKER.

Witnesses:

WM. F. McNAMARA.
JAMES T. GRAHAM.

599–601 UNITED STATES PATENT OFFICE.

S. C. TALCOTT, of Ashtabula, Ohio.

Letters Patent No. 66413, dated July 2, 1867.

Improved Button-hole for Carriages.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, S. C. Talcott, of Ashtabula, in the county of Ashtabula, and State of Ohio, have invented certain new and useful improvements in elastic button-hole for carriages, being an improvement on a patent granted to me November 13, 1866; and I do hereby declare that the following is a full and complete description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

(Here follows diagram marked p. 598.)

Figure 1 is a view of the button-hole.

Figures 2 and 6 are transverse sections.

Figures 3, 4, and 5, detached sections, to which reference will be made.

Like letters of reference refer to like parts in the views.

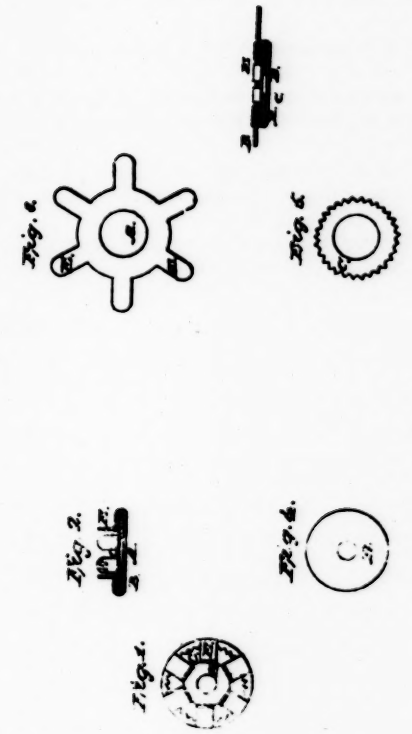
The nature of this invention consists in making the hole for the reception of the button of rubber, so that when the button is in the hole the sides of the same in virtue of its elasticity will close tightly around the neck of the button, and thereby prevent it from pulling off or in any way getting loose.

In my former patent the button-hole therein described was constructed in a similar manner, viz., with a washer, A, Fig. 3, rubber disk B, Fig. 4, and washer C, Fig. 5, all of which were arranged in the same order as the parts in this hole, and fixed to the curtains or cloth D, Fig. 6, in the same manner. But in that button-hole the washer C was simply a plain smooth-edged ring, the consequence of which was that the rubber disk was not held securely in place between the washers A C, but became displaced by the strain exerted on one side of the hole, drawing the entire disk in that direction, thereby making it difficult to unbutton and button the curtains. Also, the rubber by its elastic nature, and in consequence of its being loose between the washers, would pull out, and thus render the hole worthless. In order to avoid these difficulties, and make the rubber disk permanent in its place, and thereby preserve the useful character of the hole, the disk C is made with a serrated or toothed edge, as shown in Fig. 5. The points of the teeth are bent downward, as seen in Figs. 2 and 6. By this it will be obvious that when the rubber is laid on the washer A, and the washer C in turn laid upon

S. C. TALCOTT.

Carriage-Curtain Fastening.

No 66,413. Patented July 2, 1867.



Witnesses:
W. H. Burridge
Frank I. Alden.

Inventor:
S. C. Talcott

the rubber, the points of the teeth will penetrate the rubber and thereby hold it securely from being drawn away or displaced in any direction, thus making the rubber secure and the hole durable. In the former button-hole the washer A, Fig. 3, was provided with short angular lugs, whereas in this arrangement the washer is furnished with arms, E, which on being turned up at a right angle, as shown in Fig. 2, are introduced into the hole made in the curtain and then turned down upon it, as shown in Fig. 6, thus lapping further over upon the curtain than did the lugs in my first button-hole, giving thereby greater strength in the attachment of the button to the curtain.

What I claim as my improvement, and desire to secure by letters patent, is—

1. The washer A, provided with the arms E, disk B, and serrated washer C, arranged in the manner and for the purpose substantially as set forth.

2. A washer, Fig. 3, in combination with the disk B, when constructed substantially as described and applied to the purpose set forth.

3. The serrated washer C, in combination with the disk B, when applied to the purpose and in the manner specified.

S. C. TALCOTT.

Witnesses:

W. H. BURRIDGE.
E. E. WAITE.

603 & 604 UNITED STATES PATENT OFFICE.

S. C. TALCOTT, of Ashtabula, Ohio.

Improvement in Elastic Button-holes for Carriage-curtains.

Specification forming part of Letters Patent No. 59679, dated November 13, 1866.

To all whom it may concern:

Be it known that I, S. C. Talcott, of Ashtabula, in the county of Ashtabula and State of Ohio, have invented certain new and useful improvements in elastic loops and button-holes, &c.; and I do hereby declare that the following is a full and complete description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

(Here follows diagram marked p. 602.)

Figure 1 is a view of the outside of the loop. Fig. 2 is an inside view of the same. Fig. 3 is a detached sectional view.

Like letters of reference refer to like parts in the different views.

A piece of tin or other metal or material of a suitable thickness is cut out in the form as shown in Fig. 3. The arms or projections A are more or less in number, as the nature of the work may require.

B, Fig. 1, is a piece of rubber or other elastic material cut to the size of the ring or circle C, and upon which it is placed, and when thus placed the arms are then turned back toward the center of the ring and pressed tightly down upon the rubber. By this means the rubber and tin are held firmly and securely together. The arms, when thus turned down about one-half of their length, are then turned upward till they form a right angle with the part still down upon the rubber, assuming now somewhat the character of an eyelet. The arms thus turned up are now passed through the material of the curtain. The face of the eyelet or loop in this position is shown in Fig. 1, C being the ring or face of the loop, E the curtain, and B the rubber. It is also passed through the lining of the curtain in the same way and at the same time. If any lining should be used, when the curtain and lining are properly arranged, the arms are then turned outward from the center and pressed firmly down upon the lining, as shown in Fig. 2, A being the arms, F the lining, and E the edges of the curtain hemmed over, thereby clamping the curtain and the lining firmly together, and making a strong elastic loop or button-hole, the elasticity of the rubber at all times closing the hole tightly around the hook or stud, and the tin or eyelet preventing the loop or button-hole from tearing or breaking away.

What I claim as my improvement, and desire to secure by letters patent, is—

The tin A, or its equivalent, and the rubber B, as arranged, and in combination with the curtain E and lining F, for the purpose and in the manner herein set forth. S. C. TALCOTT.

Witnesses:

G. W. NELSON.

EDWARD H. FITCH.

S. C. TALCOTT.

Curtain Fastening.

No. 59,679 Patented Nov 13, 1866.

Fig. 1.

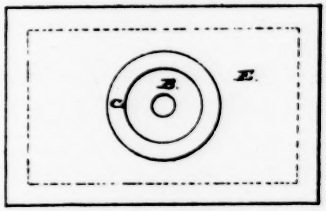


Fig. 2.

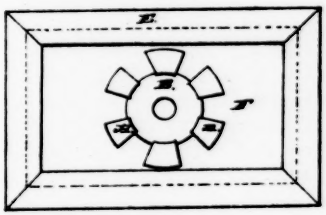
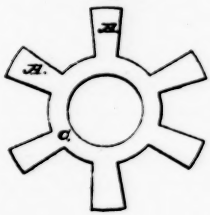


Fig. 3.



No. 259. Pat'd Feb'y 6th 66. H. Goz

Witnesses:
J. H. Burridge
I. Holmes.

Inventor:
S. C. Talcott

605 DEFENDANT'S EXHIBIT SCHLOSS FRENCH PATENT. A. E. L., Sp'l Ex'r.

REPUBLIQUE FRANCAISE.

MINISTERE DU COMMERCE ET DE L'INDUSTRIE.

Brevets d'invention.

Mémoire descriptif annexé au brevet de quinze ans pris le 2 Mai 1872, par le Sr. Schloss (Joseph) représenté par le Sr. Desnos, à Paris, boulevard Saint Martin, No. 13, et qui lui à été délivré par arrêté du Ministre de l'Agriculture et du Commerce, en date du 15 Juillet 1872, pour un système de fermoir pour gants, guêtres, chaussures, vêtements, ceintures, ceinturons, etc.

Brevet No. 95127.

Mon invention est relative à un système de fermoir pour gants guêtres, vêtements, chaussures, ceintures, ceinturons, etc.

Ce système que je pourrai désigner sous le nom de *bouton fermoir* se caractèrise par son mode de fonctionnement et par sa construction particulière qui permet de l'appliquer avec facilité aux objets sus désignés, en place et lieu des boutons, agrafes et autres modes d'attaches employés jusqu' à présent.

Le fermoir complet se compose de deux parties: l'une que j'appellerai boîte et l'autre le *bouton* ou *pêne*, destinée à pénétrer dans la première pour opérer la fermeture de l'objet.

La boîte présenté l'aspect circulaire et offre une ouverture également circulaire par laquelle doit passer le bouton le bouton.

Le bouton est un téton offrant l'aspect d'un tronc de cône renversé et qui pénètre dans l'ouverture de la boîte (laquelle ouverture) est à peu près de même diamètre que celui de la grande base du cône formant le bouton) en le présentant un peu de côté et
606 non perpendiculairement; quand le bouton se redresse, il ne peut plus sortir de la boîte, soit par une tension latérale, soit par une tension perpendiculaire.

Pour ouvrir le fermoir, il faut replacer la boîte et le bouton dans une position incliné l'une par rapport à l'autre.

Mon invention repose tout particulièrement sur la construction du dit fermoir dans le but de l'appliquer aux gants, guêtres, chaussures, de tous genres, etc.

Je pourrai encore faire usage d'un bouton fendu élastique qui, d'un diamètre un peu plus grand que le trou ne la boîte, se comprimerait pour opérer son passage dans ce trou et se dilaterait ensuite à l'intérieur de la boîte pour opérer la fermeture. A cet effet, ce bouton présenterait une surface sphérique ou des plans inclinés pour faciliter le glissement sur le bord circulaire du trou de la boîte. Ou bien encore le bouton pourrait être plein et le bord du trou de la

boîte arrondi et rendu flexible par des fentres [*sic*] en nombre convenable.

Enfin je me réserve de faire usage d'un bouton flexible et du trou également flexible.

Toutes ces dispositions se rattachent essentiellement à mon invention qui consiste, je le répète, dans l'application nouvelle aux gants, guêtres etc. d'un système de fermoir, et dans la construction spéciale de ce fermoir pour cette application mais je revendique tout particulièrement la première disposition à laquelle je donne la préférence, me réservant d'appliquer les autres facultativement.

Pour mieux me faire comprendre, j'ai représenté á titre de spécimen seulement, dans le dessin ci, joint, mon système de fermoir, d'après la première disposition.

La figure 1 montre le dit fermoir appliqué sur un gant et dans la position ouverte.

La figure 2 montre la même disposition, le fermoir étant fermé.

A Désigne la boîte et B le bouton, ces deux pièces constituant le fermoir complet.

Les figures qui suivent montrent des détails du bouton et de la boîte à une échelle exagérée afin de mieux faire ressortir la construction et la disposition des differentes pièces qui les composent.

La figure 3 montre une élévation verticale et un plan du
607 téton ou bouton proprement dit. Il se compose d'une tête *a* un peu arrondie à sa partie supérieure, et présentant sur ses côtés un plan conique fuyant. Ce téton est venu à une extremité d'une tige ou queue *b* dont l'autre extrémité est filetée pour se visser au centre d'une rondelle *c* vue en coupe transversale et en plan fig. 4.

La figure 5 montre une vue de profil, une coupe diamétrale et un plan d'une autre rondelle *d* qui vient se placer sur la surface de dessons de la rondelle *c* et y est sertie comme cela est représenté en coupe fig. 6.

Cette rondelle *d* présente en son centre un tube œillet *e* légèrement conique, faisant corps avec elle. Ce tube est destiné à passer dans le trou pratiqué dans le cuir, étoffe, ou matière quelconque où doit s'adapter cette partie du fermoir.

La figure 7 montre une coupe diamètrale, et un plan d'une troisiéme rondelle *f* présentant en son centre une ouverture circulaire *g* destinée à recevoir l'extrémité du tube *e* qui dépasse le cuir, étoffe etc. * * * Ce trou *g* est evasé ou fraisè, de façon à offrir un vide dans lequel vient se loger le métal par suite de la sertissure de l'extrémité du tube *e* sur la rondelle *f* ainsi qu' ou le voit fig. 8, qui montre une coupe diamétrale du bouton terminé et fixé en place sur le cuir, étoffe, etc.

Au lieu de visser le téton fig. 3, sur la rondelle fig. 4, je pourrai le river ou même le souder à mon choix.

Les figures 9, 10, 11, 12, 13, et 14 montrent sous differentes vues les pièces composant l'autre partie du fermoir, c'est-à-dire la boîte.

La figure 9 montre une vue de profil, une coupe diamétrale et un plan en dessus du corps de boîte *h* embouti suivant le profil indiqué.

La fig. 10 montre une coupe diamétrale et un plan en dessus d'une rondelle *i* qui se place à l'intérieur du corps *h* comme cela est indiqué en coupe figure 11.

Cette rondelle *i* présente en son centre, une ouverture circulaire *j* dont le bord est évasé on fraisé comme cela est indiqué et dont ou verra le but plus loin.

Sur la rondelle *i* vient s'adapter jointive une deuxième rondelle *k* vue de profil, en coupe diamétrale et en plan en dessus fig. 12 présentant un tube *l* en tout de construction semblable à celle décrite plus haut fig. 5 pour le bouton.

608 Les deux rondelles *i* et *k* sont ensuite serties ensemble sur le corps *h* ainsi que cela est indiqué en coupe diamétrale fig. 13, et le tout est serti sur le cuir, étoffe etc. * * * à l'aide d'une rondelle *m*, semblable à celle fig. 7 ainsi que cela est indiqué fig. 14 qui montre une coupe diamétrale de la boîte terminée et fixée en place.

La fig. 15 montre une vue de profil de l'ensemble du fermoir et la figure 16 montre une coupe diamétrale de cet ensemble dans la position fermée.

Comme on le voit la partie evasée *j* de la rondelle *i* de la boîte coincide avec le plan incliné du téton *a* de façon à permettre de placer l'ensemble de la boîte dans une position inclinée par rapport à celle de l'ensemble du bouton lorsqu'on veut ouvrir ou fermer le fermoir pour que le dit tèton *a* puisse rentrer dans l'ouverture *j* ou en sortir.

Les figures 17, 19, 20, 21, 22, et 23 montrent une disposition de bouton élastique à tête fendue.

La figure 17 montre une vue de profil et un plan en dessus de ce bouton.

La figure 19 montre une vue de profil, une coupe diamétrale et un plan en dessus d'une boîte *n* emboutie suivant le profil indiqué et formant le corps du bouton; cette boîte posséde deux fentes diamétrales *o o* et présente une embase *p* destinée à recevoir une rondelle *q* vue de profil en coupe diamétrale et en plan figure 20, ayant un tube *r* en tout semblable à celles figures 5 et 12 précédemment décrites.

Cette rondelle *q* est sertie sur la base de la boîte *n* comme cela est indiqué en coupe fig. 21, et la partie supérieure de la boîte est étranglée de manière à présenter l'aspect d'un téton spherique.

Le tout est serti en place sur l'etoffe, cuir, etc. * * * à l'aide d'une rondelle *s* figure 22 semblable à celle figure 7 ainsi que cela est indiqué figure 23 qui montre une coupe diamétrale du bouton tout monté.

C'est par son élasticité obtenue par les fentes *o o* que le bouton peut pénétrer et sortir dans le trou de la boîte, lequel trou, pour cette disposition, sera d'un diamètre un peu plus faible que celui du bouton.

609 & 610 La figure 18 montre une vue de profil d'un bouton de même construction, mais plein, c'est-à-dire ne possédant pas de fentes.

Cette dernière disposition de bouton est destinée à être employée avec une boîte dont l'ouverture est alors rendue élastique.

En Résumé je revendique comme ma propriété entière et exclusive l'application nouvelle aux gants, guêtres, vêtements, chaussures de tout genres, ceintures, ceinturons, etc., etc. * * * en place et lieu des boutons et agrafes et autres modes d'attache employées jusqu'à présent, du système de fermoir sus décrit et représenté, quelle qu'en soit la disposition, me réservant le droit de l'établir en toute matière appropriée, et d'employer, au besoin, tout moyen d'ornementation, tels que la dorme, la ciselure, la verroterie, le cuir, les étoffes etc. * * * etc. * * *

Paris, le 2 Mai, 1872.

Par Pon. de M. SCHLOSS.
A. DESNOS.

(Signé)

PARIS, le 16 Juin, 1887.

Pour expedition certifiée conforme.
Le Chef du Bureau de la Propriété Industrielle,
CH. DESTREUY. [SEAL.]

611 The following is the opinion of the court, in accordance with which the decree of September 18, 1889, was entered dismissing the bill of complaint in this cause:

Circuit Court of the United States, District of Massachusetts. In Equity.

BALL AND SOCKET FASTENER CO. *v.* EDWIN J. KRAETZER. } No. 2362.

Opinion of the Court. (*September* 18, 1889.)

COLT, *J.:*

This bill as originally filed alleged that the defendant infringed six letters patent. Five of these patents were granted to William S. Richardson and numbered respectively 260,050, 300,508, 300,509, 300,510, 325,699, and one to Albert G. Mead, September 8, 1885, and numbered 325,688. Subsequently the complainant discontinued his suit as to Richardson's patents Nos. 260,050 and 325,699.

The devices shown in these patents relate to metallic glove-fasteners, the general features of which consist in a button member attached to one flap of the garment and a resilient button-hole member attached to the other flap. The defendant's fastener is called the Kraetzer fastener and is made under certain patents issued to him. In the present suit we are only concerned with the button-hole member of the fastener. The spring which engages the button member of the Kraetzer fastener is a ring of wire split on one side so as to be capable of expansion. This spring ring is held loosely in a chamber composed of two pieces of metal united around

their edges, one of which has a tubular extension which
612 passes through the fabric and is engaged with the cap or button head on the other side of the fabric. The spring chamber is on the under side of the fabric and the button head or cap on the upper side, and the two are fastened together so as to hold the fabric between them by the upsetting of the tubular neck of the spring chamber on the upper side of the central opening of the cap. It is contended that when the spring action of the button-hole member is the socket itself it is easily impaired, whereas the spring ring of the Kraetzer fastener rests loosely in the chamber and that this enables it to be made of the best elastic material.

I do not find the Kraetzer device in any of the Richardson patents relied upon by the complainant. Indeed, from the admission of complainant's counsel it may be said that the only serious question in this case relates to the Mead patent. It is strongly urged that the Kraetzer fastener infringes claims 6 and 7 of the Mead patent, which are as follows:

"6. A member of a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it is centrally attached to the fabric, substantially as set forth.

"7. A member of a fastening device composed of a hollow socket D centrally attached to an eyelet *l*, the latter resting upon and within an annular depression *q*, formed in a concave collet or disk E, substantially for the purposes herein set forth."

In his specification Mead says:

"I consider my present invention embraces, first, the method of centrally securing the socket portion of the fastening to the article, whereby the open part or socket of said member is disposed upon the under side of the flap and secured by a rivet extending through the fabric. Thus in permanently securing it to the latter a suitable button head or cap is employed upon the upper surface of the flap and can be so formed and constructed as to form a button finish, a result much desired, since it gives the article an appearance exactly similar to an ordinary button, which is the most neat and tasty finish that can be employed in the class
613 of articles of apparel to which such fastenings are usually attached, but, further, the whole device is thereby concealed and prevented from becoming caught and broken."

The socket of Mead is composed of a cup-shaped washer with curved wings. It is applied to the interior of the glove flap, and it is secured to the exterior washer or button head by a central rivet passing through a hole in the glove flap. I do not understand that it is contended that either the cap or cup-shaped socket of Mead is new, or that an elastic mouth situated upon the under side of the flap and secured by a button head at the other side of the flap was not known in the art prior to the Mead patent. The invention of Mead, it seems to me, must be limited to his form of socket combined with an imperforate button head. The Kraetzer device does not contain the Mead socket and therefore does not infringe the Mead patent.

The complainant seeks to extend what appears to me to be the

legitimate scope of the Mead patent upon the theory that the spring-mouthed socket of Mead presses the leather upward into the button and squeezes the leather against the inner surface of the button; that this feature, in connection with the fact that the hole in the flap need not be any larger than the diameter of the rivet, introduces an important element of strength which is found for the first time in the Mead device. There are several reasons why this theory does not impress me with the importance with which it does the complainant: In the first place, I am not satisfied upon the evidence that there is any great advantage in pressing the fabric up into the button head; in the second place, I think this feature was present in the prior Dowler English patent, although it is not exhibited in the drawings; and, thirdly, Mead himself does not seem to consider this feature of sufficient consequence to claim it as a part of his invention. Before the court should give such a broad construction
614 to the Mead patent as to include something not mentioned by the patentee as a part of his invention it should certainly clearly appear that the improvement was a substantial one, and that it is not found in any prior device. In this case I do not think the complainant has made out the charge of infringement, and it follows that the bill should be dismissed.

Bill dismissed.

615 & 616 UNITED STATES OF AMERICA, *Massachusetts District*, } *ss:*

I, John G. Stetson, clerk of the circuit court of the United States within and for the first circuit and district of Massachusetts, certify that the foregoing is a true copy of the record of said circuit court in the cause in equity entitled, No. 2362, Ball and Socket Fastener Company, complainant, *v.* Edwin J. Kraetzer, defendant, lately determined in said circuit court and of all proceedings therein and of the opinion of the court filed therein.

In testimony whereof I hereunto set my hand and affix the seal of said circuit court, at Boston, in said district, this eleventh day of October, in the year of our Lord one thousand eight hundred and eighty-nine, and of the Independence of the United States the one hundred and fourteenth.

Seal of the Circuit Court, Massachusetts.

JOHN G. STETSON, *Clerk.*

617 (*Bond to Party on Appeal.*)

Know all men by these presents that we, The Ball and Socket Fastener Company of Nashua, N. H., a corporation duly organized under the laws of the State of New Hampshire, as principal, and William S. Richardson, of Boston, and John Carter, of Newton, both in the State of Massachusetts, as sureties, are held and firmly bound unto Edwin J. Kraetzer, of said Boston, in the full and just sum of five hundred dollars, to be paid to the said Edwin J. Kraetzer, his certain attorney, executors, administrators, or assigns; to which pay-

ment, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, by these presents.

Sealed with our seals and dated the ninth day of October, in the year of our Lord one thousand eight hundred and eighty-nine.

Whereas lately, at a circuit court of the United States within and for the district of Massachusetts, in a suit in equity depending in said court between the said Ball and Socket Fastener Company, complainant, and the said Edwin J. Kraetzer, defendant, decree was rendered against the said complainant, and the said complainant having obtained an appeal to remove the said cause to the Supreme Court of the United States to reverse the decree in the aforesaid suit, and a citation directed to the said defendant, citing and admonishing him to be and appear at a Supreme Court of the United States to be holden at Washington on the second Monday of October next:

Now, the condition of the above obligation is such that if the said complainant shall prosecute its said appeal to effect and answer all damages and costs if *he* it fail to make its plea good, then the above obligationto be null and void; otherwise to remain in full force and virtue.

THE BALL & SOCKET FASTENER CO., [L. S.]
By W. S. RICHARDSON, *Treasurer.*
WILLIAM S. RICHARDSON. [L. S.]
JOHN CARTER. [L. S.]

Signed, sealed, and delivered in presence of—
CYRUS V. BACON.
CATANO FRATUS.

Approved:
LE BARON B. COLT,
Circuit Judge.

A true copy of the bond taken by the judge at the time of allowing the appeal named in said bond; which bond is on file in the office of the clerk of the circuit court of the United States for the first circuit and district of Massachusetts.

Attest: JOHN G. STETSON,
Clerk U. S. C. C., Mass. Dist.

618 Supreme Court of the United States, October Term, 1889.

THE BALL & SOCKET FASTENER COMPANY, Complainant and Appellant,
vs.
EDWIN J. KRAETZER, Defendant and Appellee.

Assignment of Errors in the Judgment of the Circuit Court.

The court below erred in the following respects:

1st. In construing the Mead patent sued upon to be limited to a monopoly of the button-hole member of a glove-fastening in which

a socket member of precisely the form shown in the Mead patent was combined with an imperforate button head when applied to the glove fabric.

2nd. In declining to give weight to the peculiar and novel relations which the fabric of the glove assumes with relation to the socket member and the button head when the metallic parts are assembled upon the glove fabric by pressing the fabric into the hollow of the button head and squeezing or holding the fabric between the back of the socket and the interior of the button head.

3rd. In declaring that "this feature was present in the prior Dowler English patent, though it is not exhibited in the drawings" nor referred to in the text.

4th. In declaring that Mead himself does not seem to consider this feature of sufficient consequence to claim it as part of his invention.

5th. In finding that the Kraetzer device made by the de-
619 fendant does not contain the Mead socket and therefore does not infringe the Mead patent.

Statement of the parts of the record which complainant considers necessary for the consideration of the statement of errors on which it intends to rely.

The complainant believes that the following parts of the record forwarded to Washington contain all the matter which it is necessary for the court to consider in connection with the foregoing assignment of errors, and unless other parts of the record are demanded by the defendant and appellee the complainant and appellant will not require any other part of the record to be printed than as is hereinafter set forth:

1. The bill contained on pages 1 to 4 of the printed record at circuit.

2. The notice of discontinuance and order thereon on page 47 of said printed record.

3. The answer on pages 143 to 152 of the said record.

4. The replication on page 7 of the record and the notice and stipulation concerning the said replication and the evidence taken by complainant on the plea, being the *prima facie* case on the answer found on page 141 of the record, lines 22 to 28.

These four extracts will present the pleadings in the matured form in which they appeared at circuit.

5. The offers in evidence and certificates of incorporation and subsequent certificates and assignments on pages 26 to 32, inclusive, of the record at circuit.

6. The following parts of the deposition of Charles F. Brown, a witness for the complainant at circuit, viz., all that contained
620 on pages 7, 8, 9, and 10 as far as the end of the first paragraph on page 10, ending with the words "button-hole member;" also all that part of said Brown's deposition on pages 14 and 15 beginning with the words "The Mead patent, No. 325,688," to

the end of page 15, cross-int. and ans. on page 22, cross-ints. and ans 40 to 45, on pages 24 to 26, inclusive.

7. The following parts of the deposition of Chandler Hall on the part of the defendant, ints. and ans. 1 to 4 on pages 33 to 45, and offers of evidence following, except that contained on page 35 after the first paragraph, which ends "eight claims only," and except also the matter on pages 36, 37, 38, and 39 as far as the words at the end of the third paragraph, "Richardson patent, No. 325,698."

8. The depositions of Albert G. Mead and Albert E. Leach on pages 43 to 47.

9. The depositions of Joseph P. Livermore on pages 47 to 50 to the end of the ans. to int. 4 and on pages 70 to 87 from int. 9 to the end of the ans. to int. 11, and all the cross and redirect and re-cross examination of said Livermore from page 87 to page 125.

10. The deposition of Albert G. Mead from page 125 to page 141.

11. The offers in evidence on pages 141 to 143.

12. The deposition of Edward E. Quimby, pages 153 to 210, and of William S. Richardson, pages 210 to 217.

13. Exhibit File-wrapper and Contents No. 5, page 286 to page 301.

14. Exhibit Schloss French Patent, pages 324 to 328; Schloss
621 English Patent, pages 328 to 332; Bayer English Patent, pages 332 to 335; Dowler English Patent, pages 339 to 348, and, besides this, the matter on pages 352 to 357.

15. Of the printed United States patents at the end of the record the following are all which are thought to be anyway relevant or competent on the errors assigned and all which are thought in any way to be referred to in the evidence which has been cited:

The Mead patent, No. 325,688, on page 371 and following;
The Kraetzer patent, No. 281,376, on page 437 and following;
The Kraetzer patent, No. 290,067, on page 441 and following;
The Kraetzer patent, No. 306,021, on page 445 and following;
The Kraetzer patent, No. 359,614, on page 449 and following;
The Kraetzer patent, No. 359,615, on page 453 and following;
The Richardson patent, No. 276,714, on page 465 and following;
The Richardson patent, No. 300,508, on page 359 and following;
The Richardson patent, No 300,509, on page 363 and following;
The Platt patent, No. 181,979, on page 461 and following;
The Whitby patent, No. 241,767, on page 549 and following;
The Mead patent, No. 227,440, on page 460 and following;
The Pringle patent, No. 260,411, on page 405 and following;
The Taynton patent, No. 125,502, on page 589 and following;
The Acker patent, No. 60608, on page 593 and following;
The Talcott patent, No. 66413, on page 597 and following;
The Talcott patent, No. 59679, on page 601 and following,

together with the models and exhibits illustrative of the forms of fastenings which were in evidence at circuit and are referred to in those portions of the depositions of witnesses which complainant and appellant has already specified should be printed.

622 16. The opinion of the court at circuit, delivered September 18, 1889.

BALL & SOCKET FASTENER CO.,
By THOS. WM. CLARKE,
Solicitor & Counsel.

BOSTON, MASS., *Feb. 6th*, 1890.

W. B. H. Dowse, Esq., counsel for appellee.

DEAR SIR: Please to take notice that I propose to file with the clerk of the supreme court, under the 9th sec. of Rule 10, the foregoing statement of errors and of the parts of the record which we think necessary for the consideration of the errors.

Will you please acknowledge service hereof, and, within ninety days from date of filing, designate in writing such additional parts of the record in the case Ball & Socket Fastener Co., complainant and appellant, *vs.* Edwin J. Kraetzer, defendant and appellee, which you think material?

I am very truly yours,

BALL & SOCKET FASTENER CO.,
By THOS. WM. CLARKE,
Solicitor & of Counsel.

A copy of the foregoing papers was served on me this seventh day Feb., 1890.

W. B. H. DOWSE, *Def't- Solic.*

623 [Endorsed:] Supreme Court U. S. 1889, October term. No. 289. The Ball & Socket Fastening Co., &c., app't, *vs.* Edwin J. Kraetzer. Statement of errors & designation by appellant of parts of record to be printed.

[Stamped:] Office Supreme Court U. S. Filed Feb. 10, 1890. James H. McKenney, clerk.

624 Supreme Court of the United States, October Term of 1889.

BALL & SOCKET FASTENER COMPANY, Complainant and Appellant,
v.
EDWIN J. KRAETZER, Defendant and Appellee.

Statement of the parts of the record which defendant and appellee considers necessary for consideration of the statement of errors on which The Ball and Socket Fastener Company, complainant and appellant, intends to rely, viz., all the matter set forth by the complainant in its statement of evidence served on the defendant under Rule 10, section 9, made March 28th, 1887, October term of 1886; also

The defendant requires all the deposition of Chandler Hall, instead of the parts thereof referred to by the complainant, to be printed, said deposition being found in the printed record at circuit on pages 33 to 43.

All the deposition of Joseph P. Livermore, instead of the parts thereof referred to by the complainant, to be printed, said deposition being found in the printed record at circuit on pages 47 to 125.

All the deposition of Charles F. Brown found in the printed evidence, pages 7 to 26 of the printed record at circuit.

Also the Brown drawing, Ball & Socket Fastener Company *v.* Kraetzer, found at page 15 of the printed record.

625 Also all the drawings found annexed or referred to in the deposition of Joseph P. Livermore, found at pages 60, 66, 70, 89, and 114 of said Livermore's deposition.

All of the United States and foreign letters patent, viz:

Defendant's Exhibit Schloss French Patent No. 95127, dated July 15, 1872; Defendant's Exhibit Schloss English Patent No. 1450 of 1870, dated May 19, 1870; Defendant's Exhibit Bayer English Patent No. 809 of 1877, dated the 28th day of February, 1877; Defendant's Exhibit Dowler English Patent No. 795 of 1883, dated February 13, 1883.

United States letters patent to—

Boeklen and Stachlen, No. 33025, dated Aug. 13, 1861.
W. S. Richardson, No. 260,050, dated June 27, 1882.
W. S. Richardson, No. 300,508, dated June 17, 1884.
W. S. Richardson, No. 300,509, dated June 17, 1884.
W. S. Richardson, No. 300,510, dated June 17, 1884.
A. G. Mead, No. 325,688, dated Sept. 8, 1885.
W. S. Richardson, No. 325,699, dated Sept. 8, 1885.
W. S. Richardson, No. 325,698, dated Sept. 8, 1885.
A. A. Abbott, No. 79800, dated July 14, 1868.
H. T. Lee, No. 108,491, dated Oct. 18, 1870.
I. J. Saunders, No. 129,255, dated July 16, 1872.
H. A. Church, No. 227,094, dated May 4, 1880.
E. Pringle, No. 260,411, dated July 4, 1882.
J. W. Meeker, No. 266,710, dated Oct. 31, 1882.
G. J. Capewell, No. 3307, dated Feb. 23, 1869, reissue.
Clark M. Platt, No. 118,640, dated Aug. 29, 1871.
E. Essex, No. 235,144, dated Dec. 7, 1880.
C. Downs, No. 218,864, dated Aug. 26, 1879.
626 T. C. Bates, No. 236,663, dated Jan. 18, 1881.
L. Goulding, No. 252,311, dated Jan. 17, 1882.
W. M. Williams, No. 331,266, dated Nov. 24, 1885.
E. J. Kraetzer, No. 281,376, dated July 17, 1883.
E. J. Kraetzer, No. 290,067, dated Dec. 11, 1883.
E. J. Kraetzer, No. 306,021, dated Sept. 30, 1884.
E. J. Kraetzer, No. 359,614, dated Mar. 22, 1887.
E. J. Kraetzer, No. 359,615, dated Mar. 22, 1887.
A. G. Mead, No. 227,440, dated May 11, 1880.
C. M. Platt, No. 181,979, dated Sept. 5, 1876.
W. S. Richardson, No. 276,714, dated May 1, 1883.
C. H. Mumford, No. 231,234, dated Aug. 17, 1880.
F. E. Drake, No. 43152, dated June 14, 1864.
D. Rait, No. 8860, dated Apr. 6, 1852.
C. McIntire, No. 22442, dated Dec. 28, 1858.

R. B. Ruggles, No. 49305, dated Aug. 8, 1865.
F. I. Palmer, No. 53471, dated Mar. 27, 1866.
F. I. Palmer, No. 53472, dated Mar. 27, 1866.
I. Cole, No. 88451, dated Mar. 30, 1869.
Somers & Atwood, No. 3421, dated May 4, 1869, reissue.
C. N. Brown, No. 178,726, dated June 13, 1876.
A. E. Newcomb, No. 155,383, dated Sept. 29, 1874.
E. Schnopp, No. 180,938, dated Aug. 8, 1876.
C. A. Wood, No. 203,308, dated May 7, 1878.
A. B. Kittson, No. 206,883, dated Aug. 13, 1878.
W. P. Dolloff, No. 210,017, dated Nov. 19, 1878.
L. Hill, No. 225,375, dated Mar. 9, 1880.
L. Hill, No. 222,400, dated Dec. 9, 1879.
W. P. Dolloff, No. 230,115, dated July 20, 1880.
627 E. Wright, No. 233,060, dated Oct. 5, 1880.
E. Loewenthal, No. 244,632, dated July 19, 1881.
J. Whitby, No. 241,767, dated May 17, 1881.
J. Barclay, No. 69959, dated Oct. 22, 1867.
L. C. Chase, No. 91308, dated June 15, 1869.
L. C. Curran, No. 176,932, dated May 2, 1876.
P. F. Mauvas, No. 60217, dated Dec. 4, 1866.
C. N. Nickerson, No. 83405, dated Oct. 27, 1868.
C. A. Newton, No. 117,916, dated Aug. 8, 1871.
S. S. Ritter, No. 47661, dated May 9, 1865.
C. Robitaille, No. 54071, dated Apr. 17, 1866.
H. S. Wing, No. 187,442, dated Feb. 13, 1877.
James Taynton, No. 125,502, dated Apr. 9, 1872.
C. W. Acker, No. 60608, dated Dec. 18, 1866.
S. C. Talcott, No. 66413, dated July 2, 1867.
S. C. Talcott, No. 59679, dated Nov. 13, 1866.

All of which patents are found printed and attached to the end of the record in said suit at circuit.

EDWIN J. KRAETZER,
By WM. B. H. DOWSE,
For Defendant.

628 Supreme Court of the United States, October Term of 1889.

BALL & SOCKET FASTENER COMPANY, Complainant and Appellant,
v.
EDWIN J. KRAETZER, Defendant and Appellee.

Thomas Wm. Clarke, Esq., 32 Pemberton Sq., Boston.

DEAR SIR: Please take notice that I propose to file the accompanying statement of the parts of the record in the above-entitled case at circuit which the defendant considers necessary for consideration of the statement of errors filed by you in the above-entitled suit, as set forth in its assignment of errors in the judgment of the

circuit court served on me February 2, 1890. Will you please acknowledge service thereof.

Very truly yours, EDWIN J. KRAETZER,
By WM. B. H. DOWSE, *Solicitor, &c.*

BOSTON, *April 4th*, 1890.

Service acknowledged this tenth day of April, 1890.

THOS. WM. CLARKE.

629 [Endorsed:] 1515. United States Supreme Court. 1892, Oct'r term. No. 289. Ball & Socket Fastener Co. app'ts, *v.* Edwin J. Kraetzer. Designation by appellee of parts of record to be printed. Filed April 26, 1890.

[Stamped:] Office Supreme Court U. S. Filed Apr. 26, 1890. James H. McKenney, clerk.

Endorsed on cover: Case No. 13,922. Massachusetts C. C. U. S. No. 289. The Ball and Socket Fastener Company of Nashua, N. H., appellant, *vs.* Edwin J. Kraetzer. Filed November 18, 1889.

58

Office Supreme Court U. S.
FILED.
SEP 13 1893
JAMES. H. McKENNEY.
CLERK.

SUPREME COURT OF THE UNITED STATES,

OCTOBER TERM, 1892.

No. 289.

THE BALL & SOCKET FASTENER COMPANY,
Appellant,

v.

EDWIN J. KRAETZER,
Appellee.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

BRIEF FOR COMPLAINANT AND APPELLANT.

Supreme Court of the United States,

OCTOBER TERM, 1892.

No. 289.

THE BALL & SOCKET FASTENER COMPANY,
Appellant,

v.

EDWIN J. KRAETZER,
Appellee.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

BRIEF FOR COMPLAINANT AND APPELLANT.

Statement.

This was a bill in equity originally brought January 27, 1887, by the appellant, against Edwin J. Kraetzer, the appellee, charging him with infringement of several patents enumerated in the bill, but which for subsequent considerations need not be here considered.

On April 13, 1887, a plea was filed alleging that the bill was multifarious, which plea was replied to, and on February 14, 1888, two of the patents were stricken from the bill (p. 5). An answer was then

filed (p. 6), the nature of which will be considered hereafter.

In the May term, 1889, the cause was heard before his honor Judge COLT, and on September 18, 1889 (p. 13), the bill was dismissed.

The opinion of the court dismissing the bill is on page 348 of the record. It therein appears, on page 349, that the only patent relied on at final hearing was the Mead patent of September 8, 1885, No. 325,688.

Appeal was taken and security given (p. 13), and under the rule in October term, 1889, as early as February 10, 1890 (pp. 351–354), under the ninth section of rule 10 then existing, a statement of errors in the judgment of the Circuit Court, and of the parts of record thought necessary for the consideration of the errors, was filed.

REDUNDANT PRINTING.

The quantity of printing required by the appellant was as follows: —

	Pages.
The bill (pp. 1–4)	4
Notice of discontinuance, &c. (p. 47) . .	1
Answer (pp. 143–152)	10
Replication (p. 7)	
Stipulation, &c. (p. 141)	1
Offers in evidence and certificates of incorporation, &c., and assignments (pp. 26–32)	6

Extracts from the deposition of Charles F. Brown on pages 7, 8, 9, 10 of the record below, and certain parts on pages 14, 15, 22, 24, 26 of the record below, being the matter contained in the Brown deposition of the present record from page 13 to end of 3d paragraph on page 15; on page 18 of the present record from the beginning of the 6th paragraph to the end on page 19; int. and ans. 33 on page 24, and ints. and ans. 40–45 (pp. 26, 27) 6

Extracts from the deposition of Chandler Hall on the part of the defendants, and offers of evidence, being from pages 33–45 of the record below, and in the present record the 1st, 2d, and 3d ints. and ans., the 4th int. and its ans. as far as the end of the 6th paragraph on page 33, then beginning on the 37th page of the present record, 2d paragraph, to the Mead deposition on page 43 . . . 4

Depositions of Mead and Leach, pp. 43–47 below, 40–43 present record . . . 3

Extracts from deposition of Livermore, pp. 47–50 below, 43, 44, present record, except int. 5; pp. 70–87, from int. 9, end of answer, to int. 11, pp. 60–72, present record; direct and cross examination from pages 87 to 125, record below, 72–100, present record . 42

Deposition of Albert G. Mead, pp. 125–141 below, 101–113 here 13

Offers in evidence on pages 141–143, present record, 113–115 2

Depositions of Quimby and Richardson, pp. 153–217, record below, pp. 115–164, present record 50

NOTE. — In the record below, the answer was printed out of place between pages 143 and 152, so that the Quimby evidence begins on marginal paging 145, which marginal paging has been arranged to gain in numbers until, on page 121 of the present record, the marginal paging becomes 162, and corresponds with the page of record below.

Pages.

Exhibit File Wrapper and Contents No. 5, pp. 286–301 26

Exhibits of sundry English patents, from pp. 324–348 25

Bill and French specification, pp. 352–357 . 5

Together with seventeen patents more or less relevant to the argument, being the —

	Original Record.	Present Record.	Pages.
Mead patent . . .	371–375	211	4
Kraetzer patent . .	437–440	439	3
Kraetzer patent . .	441–444	259	3
Kraetzer patent . .	446–450	262	5
Kraetzer patent . .	449–452	266	3
Kraetzer patent . .	453–456	269	3
Richardson patent . .	465–468	276	3

Richardson patent . .	359–362	202	3
Richardson patent . .	363–366	205	3
Platt patent . . .	461–464	274	3
Whitby patent . .	549–552	317	3
Mead patent . . .	457–460	272	3
Pringle patent . .	405–408	233	3
Taynton patent . .	589–591	338	2
Acker patent . . .	593–595	340	2
Talcott patent . .	597–599	342	2
Talcott patent . .	601–603	344	2
			50

Also the opinion of the court at circuit, pp. 348–350, P.R.

This matter, with the bond, certificate of the clerk, and assignment of errors, amounting to about four pages more than the matter above referred to, and the whole amounting to two hundred and forty-seven pages, and requiring in that some twenty-five full-page illustrations.

The marginal paging in this case shows 629 pages, but the leaf paging or corner paging, which omits to count the drawings, is 357.

The defendant therefore has insisted upon printing more than one hundred and thirty pages of text beyond appellant's requirement, and in the present record, the matter from page 176 to page 348 consists wholly of patent specifications and their drawings, one hundred and seventy-three pages. Of this

matter we have thought proper to print about 80 pages.

There are in this matter seventy patent applications, all of them but two having annexed drawings, one of them being without a drawing, while some of the others have two pages of illustrations, and there are two drawings which have no text.

It can clearly be seen that this is an occasion for putting the 9th section of rule 10 into practice. Everything introduced in evidence below was required to be printed in this record by the defendant.

Only one of Complainant's Patents to be Passed on by this Court.

It will be observed from the opinion of the court (p. 349), that the only serious question before the court below relates to the infringement of the Mead patent. The court held that the Kraetzer patent did not infringe the Mead, and the errors pointed out are all as to the ruling of the court upon the Mead fastener; and for the consideration of those errors which led to the dismissal of the bill on the Mead patent, we ask the revisory action of this tribunal.

Complainant's Status.

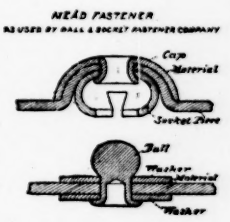
The complainant is a New Hampshire corporation formed January 19, 1884. The articles of association are found on page 28, the certificate of payment of stock on page 29, the assignment of sundry pat-

ents on page 30, and another assignment on page 31, all in the year 1884.

Mead Patent of September 8, 1885.

The patent in this case is averred (p. 2, par. 6) to have been issued to Albert Gallatin Mead, assignor to the Ball & Socket Fastener Company, on September 8, 1885, No. 325,688, and it so appears on the patent, the specification of which is found on page 211. The file wrapper and contents of this patent showing the proceedings in the Patent Office are found at page 164, and following.

Subject Matter.



A practical form of the Mead fastener is shown in the annexed cut. There is on the button side a knob with a shank to it, which passes through two washers, one of which washers is above and the other is below the glove fabric, and the shank is upset on the lower side of the lower washer.

The swell of the knob is sufficient to allow of an engagement with the clasp or spring sides of the buttonhole member of the fastener. This buttonhole member of the fastener is in two pieces, one of which is a hollow hemisphere having an eyeleting shank drawn downward at its centre. By this eyeleting

shank it is engaged with the piece called the socket, which is a piece of nearly spheroidal shape, the upper part of it almost hemispherical and perforated at its polar region, the lower part of it formed of two inwardly projecting wings separated by a short interval, whereby springing flanges are produced to catch and hold the neck of the ball of the button member.

It will be observed that, in the application of this fastener to a glove fabric, a hole is pierced in the glove fabric about large enough for the passage of the eyeleting shank, and that the two adjacent hemispheroidal metallic surfaces, one of which surfaces is the outside of the upper part of the socket, and the other of which is the inside of the cap or exterior hemispheroidal piece, are for some considerable distance parallel to each other, and that the fabric of the glove is stretched into a dome shape which is compressed or nipped between the back of the socket and the inside of the hemispheroidal cap, and is firmly held by this engagement.

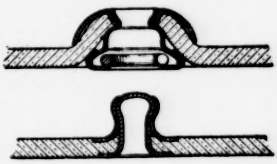
An axial line through the centre of the eyeleting shank which fastens the parts together upon the fabric would be a polar diameter of the hemispheroid which we have been considering.

This engagement, therefore, between the fabric and the parts of the fastener is an engagement at one end of the common polar diameter, and is an engagement at the middle of any arc of a great circle which passes through the pole. It can then be described properly that these parts are centrally fast-

ened upon the fabric, because the word "centrally" is here used as the antithesis of "peripherally," as will hereafter appear.

Infringement Alleged.— Kraetzer Fastener.

The infringement alleged is in the manufacture and sale of the Kraetzer fastener which is illustrated in the margin. In this case there is a hemispheroidal cap corresponding very nearly to the hemispheroidal cap of the Mead fastener. This cap has a depression around the pole.



Kraetzer Fastener.

The clasp or button member of this fastener is composed of a hemispheroidal or dome-shaped piece enough smaller than the cap to allow of the presence of a glove fabric between the cap and the socket, and this hemispheroidal socket has drawn from it an eyeleting shank which passes through the fabric of the glove and through the hole at the pole of the cap, and is upset at its end into the depression of the cap around the hole at the pole. The edge of this hemispheroidal socket is turned outward instead of inward, and there is applied to the edge a piece of brass perforated at its geometrical centre, and seamed at its edge to the flange at the bottom of the hemispheroidal part of the socket. Within the cavity thus made between the flange at

the equator of the hemispheroidal part of the socket and the flange which covers the bottom of the socket and is perforated in the centre, is placed a spring ring of brass, which is cut to give it elasticity.

The button member is a knob formed with a neck and a flange. This knob is built of two pieces, one of them a hat-shaped eyelet, the flange of which is placed below the cloth, the barrel of which is passed through a hole in the fabric and extends up through the hollow of the neck and into the expanded head of the knob member, and it is there upset or expanded to fill the interior of this knob, and so produce the effect of a knob fastened to the glove fabric on one side. The difference between this button member and that of the Mead patent is that one has a double-thick knob (Mead, p. 211, fig. 11), the other a knob single-thick on top, but double elsewhere.

The opening of the split ring is rather smaller than the head of the knob; but, by reason of the fact that this spring ring is cut, the knob can be passed through it.

We have then here in the buttonhole member, a socket which has a hemispheroidal upper part, and has a spring clasp for the lower part, and this is adapted to be engaged with the neck of a knob which forms the button member of the fastener.

This device is alleged to infringe the 6th and 7th claims of the Mead patent, page 215, which read as follows: —

"6. A member of a fastening device consisting of

a hollow socket in combination with a rivet and button head, whereby it [the hollow socket] is *centrally* attached to the fabric, substantially as set forth."

"7. A member of a fastening device composed of a hollow socket, D, *centrally* attached by an eyelet, *l*, the latter resting upon and within *an annular depression*, *q*, formed in a concaved collet or disc, E, substantially for the purposes herein set forth."

And clearly it does embody the combination of these claims, if the word "centrally" means at a point which equally subdivides any arc of a great circle lying wholly within the metallic periphery of the socket and extending from edge to edge, — if "centrally" is the antithesis of circumferentially, as will be shown.

State of Art.

It will now be convenient to consider the state of the art prior to the year 1885, at or about which date the Mead application was prepared. The petition (p. 165) was signed December 18, 1884. The oath was made December 18, 1884, and the case was filed in the Patent Office February 2, 1885 (p. 175). The patent was granted September 8, 1885. The state of the art, therefore, prior to the year 1885 is to be considered in construing this Mead patent.

Buttons and Button Fasteners.

The ordinary button of hard material fastened by or through its centre to the fabric of a garment, and standing like a mushroom out from the fabric and engaging with a slit in the opposite lap of the fabric, was not in 1885, and is not now, a thoroughly satisfactory method of fastening the laps of garments together. Even for military purposes, the Russian, the Austrian, the Prussian, the Englishman, makes large use of hooks and eyes.

Various efforts have been made to improve this method of connection, which generally involve the attachment of metallic parts to the fabric of both the laps, one of them serving as a button and the other as a buttonhole, and it has not been unusual to provide the buttonhole with a cover or cap more or less resembling a button, and to make the engagement between this buttonhole member and the button member a spring engagement.

An early instance of this is found in the Schloss English patent No. 1450, of May, 1870 (p. 179), where there was a button-shaped cap and plate secured thereto, having spring fingers projecting inward about its centre, and provided with a cylindrical sleeve to screw upon another cylindrical sleeve attached to the interior of the button-shaped head, as shown in fig. 12 of the Schloss drawing (p. 181). This article was fastened to the fabric by pressing the fabric between the down-turned edges of the button head and the

horizontal plate from which the spring flanges projected.

The fabric pulled horizontally very much like the noose formed by making an eye-splice in the end of a rope, when this noose is cast over a post, as is frequently seen in steamboating when the boat makes a landing.

This device was afterwards improved by Schloss in the details of fastening together (see p. 176). In the drawing as printed in the present record, at least in appellant's copy of it, a little more economy of ink in the government printing office would have tended advantageously to clearness. In this, however, can be seen in fig. 16 (p. 177), that there is a button member attached to the lower garment lap by means of washers and eyelets, as shown in figs. 6, 7, and 8, the parts of the buttonhole member called by Mr. Leach the "socket" (pp. 176, 177), and by Mr. Schloss the "*boite*" (pp. 346, 347), consist of what Mr. Leach calls the "cap of the socket *k* (p. 177) and what Mr. Schloss calls the *corps de boite h*, and of a washer, *i*, having the circular opening *j*, and another washer, *k*, with a tube attached to it; in fact, an eyelet which fastens on this buttonhole member by means of a washer.

Leaving the explanation of the button, and coming down to an understandable description of the buttonhole member, there was a more or less button-shaped cap having an elevated centre. There was a perforated washer near the bottom of this cap. There

was an eyelet having its stem projecting away from the cap fastened to the cap and the washer referred to, by seaming the edge of the cap over the edges of the washer and of the flange of the eyelet; and this arrangement was fastened on by passing the barrel of the eyelet through a washer on the lower side of the fabric.

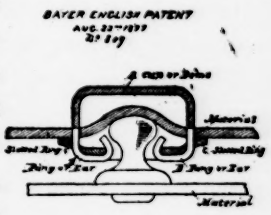
The edge of the interior washer first referred to was bevelled, and the tilting of the stem of the stud on the buttonhole side so pressed it against the upper and lower edges of this bevel that it could not be readily withdrawn without the aid of the hand.

We have here then in Schloss as early as 1882 two different buttonhole members, one having a spring buttonhole, and the other not having a spring buttonhole, but sometimes it appears, from the button used, with a spring button, which buttonhole members had button-like caps and interior arrangements for engaging the button member, and these buttonhole members were fastened to the fabric by punching a hole in it, and passing a cylindrical hollow stem or barrel through that hole, and a washer, and so engaging the parts with the fabric that the fabric was clamped between two horizontal parallel flanges, and thus held more or less firmly. They were circumferentially attached, not centrally attached.

The only part of the cap of either of these structures which comes in contact with the fabric is the outer and lower edge or face.

In 1877, the Beyer English patent (p. 182) was

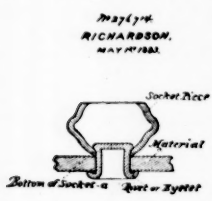
granted, in which there was described a button head and sort of springing washer or ring slit upon one side, which lay below the fabric, and was held in place and in proper relation to the cap by fangs or ears that passed through the fabric and through holes in this split ring, and fastened it to the fabric at two diametrically opposite points of its circumference. In this case the cap engaged the fabric only at its lower and outer edge, that is to say, *circumferentially* not centrally.



Pringle in the United States patented in July, 1882, on an application filed July 4, 1882 (p. 233), an apparatus in which the buttonhole member was of the shape of a button head, and was fastened on by a long eyelet having a hole in one side into which the end of a coiled spring was pressed, which was so arranged as to be displaced by the passage of a stud through it. The cavity of the hollow cap of this Pringle device was closed at one side by a plate through which the stem of the fastening-on eyelet passed, which stem was upset on the lower side of the fabric. The engagement of this buttonhole member with the fabric was between the closing plate at the bottom of the hood and the washer placed on the opposite side of the cloth, and the fabric lay horizontal. It was circumferentially attached. The hollow socket, if represented at all,

is a cylindrical tube. The rivet, if represented at all, is the upper end of this tube and the button head.

As early as July 13, 1882, William S. Richardson invented a socket member for a glove fastening, in which the socket was of hemispherical character with depending spring edges, and this socket was adapted to be fastened by a hole through the centre of its dome to a glove fabric by an eyelet. This nearly globular form of clasp was adapted to engage a ball which shall be inside of the globe, by the depending spring flanges which form the lower part of the globular socket and project inwards to seize the neck of the ball which is to enter the socket, was at that time a new, and, as it has turned out, a useful element of a buttonhole member. It was patented to Richardson by Letters Patent 276,714, on page 276 of the record, and it was distinctly claimed, without regard to the method of fastening it on, as follows (p. 277): —

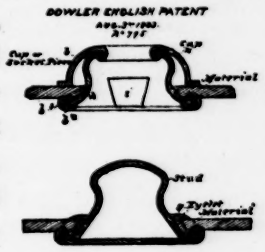


"A member of a fastening device comprising a socket, C, formed of sheet metal, and having the spring sides *d* or upper section thereof integral with the part *a* forming its lower portion, all substantially as and for the purpose described."

This Richardson fastener's socket was *centrally* and not circumferentially attached to the fabric.

Half a year later, in February, 1883, the Dowlers

filed their provisional specification for patent 795 of 1883. The complete specification of this Dowler patent was filed in August, 1883. It described and showed very clearly a socket quite similar to the Richardson socket just referred to, but this socket, called by Dowler an eye, had a perforation in the top of the dome; the edges of the spring flanges also were turned outward after the sides of the spring flanges had been drawn in, and these edges were recommended to be bound by a ring. This Dowler socket is shown quite clearly in figure 6 of his drawings, and the arrangement for fastening it on was by means of a cap of very much the same shape, that is to say, of a button-head shape, which is called by Dowler (p. 191) a dome-shaped cap, *k*, the upper edge of which is eyeleted around the hole in the top of the dome or cup *b*, as seen in figs. 3 and 4, and marked *l*.



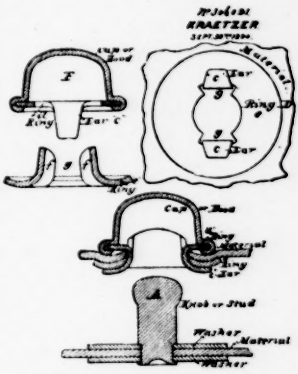
The description of the method of attachment of Dowler to the fabric by the eyeleting of the cap *k* is that the material is gripped between the base of said cap *k*, and the ring b^3 at the mouth of the dome or inverted cup *b*. It is described that the dome or cup is passed through a hole in the material from the the back thereof, so that its ring b^3 bears on the under side of the material; the dome or cup *b* on the upper side of the material is then covered with a

dome-shaped cap, *k*, the upper edge of which is eyeleted around the hole in the top of the dome or cup *b*, as seen in figs. 3 and 4, and marked *l*.

This socket of Dowlers, or inverted cup, is substantially the Richardson socket of Richardson's American patent No. 276,714. It is fastened to the material circumferentially and not centrally. It requires a dome washer to fasten it on, and it requires the flanges of the lower edges of the cup or socket to be turned outward. The mode of fastening together the two metallic parts, namely, the metallic head having a button-like appearance or dome washer and the socket to receive the ball, is by passing the body of the socket through a hole in the fabric until the outwardly turned flange at the bottom of the socket comes in contact with the fabric; the parts are then eyeleted together above the plane of the cloth, metal to metal, and there is no fabric between the interior of the dome washer and the exterior or back of the inverted cup forming the spring flanges, at or near the place where the eyeleting is done; and indeed, the size of the eyelet hole represented is such that there could be no particular engagement of fabric at this place. There is no glove fabric at the centre. The attachment of the hollow socket to the fabric is *circumferential*, and not *central*, with Dowler.

Kraetzer, then, in September, 1884, on an application filed July 31, 1884, obtained a patent (p. 262) in which the buttonhole member was provided with a

hood in the shape of a button head. This hood had a perforated base plate seamed to it, from the inner edge of which perforated base plate two ears diametrically opposite to each other projected downward. These ears passed between the terminal edges of two flanges diametrically opposite to each other which were struck up from the centre of a plate at just sufficient interval from each other to allow of the passage of the two ears between the edges of the flanges, a hole being made in the fabric which fitted around the vertical part of the flanges and the dome with its base plate being brought down upon the fabric, and its ears passed through the fabric at the interval between the flanges of the washer were turned down upon the flanges and held the parts together. This again was a circumferential attachment, not a central.



Summary of the State of the Art in February, 1885.

Up to this time, while we have had several button-hole members having hoods or covers which presented a button-like appearance, and while we have had several methods of fastening the parts together,

we have found no method of fastening the parts together by which the fabric of the glove was necessarily curved or moulded to adapt it to the shape of the interior of the dome washer and the exterior of the cup or socket. All the attachments of the hollow socket to the fabric, except the Richardson, were circumferential.

Advantage of Central Attachment.

By the central attachment of the socket to the fabric, three results ensued: *First.* The hole for the assembling rivet was smaller as compared with the transverse diameter of the socket. This gave a greater mass of material to resist separation of parts. *Second.* The material was moulded, and thereby stretched before the strain of separation was applied, and was thus clasped for longer distance outside of the hole between clamping surfaces. *Third.* The strain was indirectly applied: it pulled round a corner as a steamer's hawser does round a snubbing post.

By this construction and form of *central* attachment the parts were better held to the fabric, for two reasons; a heavier, harder strain was required to detach the parts from the fabric, and the strain which is applied to the fabric, and tends to separate the parts, is partly expended in changing direction of the pull. The destructive force is lessened, the conservative force is increased, a result which inevitably follows when the socket is centrally attached to the fabric.

Mead's Fastener of 1885.

Mead, who had already figured as an inventor in this field, as may be seen by reference to page 272, patent No. 227,440, of May 11, 1880, in which there is a buttonhole member which presents a button-like appearance, now comes into the field with his patent (p. 211) of September 8, 1885, No. 325,688, the application for which was filed February 2, 1885.

In this he provides to use what is substantially the Richardson socket of fig. 17, Letters Patent No. 276,-714 (p. 276), but he combines with it a dome-shaped washer presenting a button-like appearance, and the eyeleting is done through the centres of the domes of the dome washer and the socket. As, however, there are no outwardly turned flanges to the Richardson socket which he employs, he is obliged to make the engagement between the parts very close around the barrel of the uniting eyelet, and to mould the fabric between the interior of the dome washer and the exterior or back of the socket; otherwise it would not hold on. Instead of making a hole large enough for the socket to go entirely through were it not for a horizontal flange at its lower edge, he made the hole very much smaller, so that the post around which the fabric is clamped is simply the barrel of the eyelet which unites the parts together. There is no nip of the lower edge of the dome washer upon the fabric, first, because there is nothing for the lower edge of the washer to nip against, and secondly, because

the engagement between the cloth and the two adjacent surfaces is much higher up upon the back and near the centre of the dome.

In order to make a neat finish, he at times covered this apparatus entirely over with an imperforate cap, at times he used a perforated cap. When he used the perforated cap without more, he made a countersink around the hole through which the shank of the attaching eyelet came, so that when that shank was flanged outwardly it would enter the recess of the countersink and the upper surface of the button might be smooth.

The attachment here was central, not circumferential.

Mead's Claims.

The Mead patent, page 211, says, —

"I consider my present invention embraces, first, the method of centrally securing the socket portion of the fastening to the article, whereby the open part or socket of said member is disposed upon the under side of the flap and secured by a rivet extending through the fabric; thus, in permanently securing it to the latter, a suitable button head or cap is employed upon the upper surfaces of the flap, and can be so formed and constructed as to form a button finish, a result much desired, since it gives the article an appearance exactly similar to an ordinary but-

ton, which is the most neat and tasty finish that can be employed in the class of articles of apparel to which such fastenings are usually attached; but further, the whole device is thereby concealed and prevented from becoming caught and broken."

On page 211, he says,—

"Fig. 2 of the drawings is a vertical section of the socket member completed and attached to the fabric. Fig. 4 shows the button-shaped cap with the fastening eyelet or rivet without the socket portion. Figs. 5 and 6 are cross-sections taken diametrically through the socket portion. Fig. 7 is a plan of the complete socket member."

Fig. 12 is here stated to represent the other member (socket member) of the fastening, and its attaching devices. This fig. 12 is further described on page 214 as "a slight deviation in the manner of finishing the button portion [*buttonhole member*] of the fastening shown in fig. 2, and as dispensing with the button head F of that figure.

This socket portion, then, consists essentially of three parts, one of which is the socket or clasp marked D, another of which is the washer of a dome shape, concave towards the socket member, and marked E, and the third of which is the uniting eyelet which is marked *l*, and is described on page 213, in the last paragraph.

The socket Mr. Mead proposed to employ below the fabric and dispose an ordinary fastening eyelet, *l*,

through the socket D. This eyelet is located centrally of the socket, and, when this part of the fastening is completed, is secured and rests at its top between the cap or button head F, which surrounds the hole and the disc E, while its lower extremity is similarly upset upon and over the interior periphery of the socket D. When finished, the disc E is curved, as shown in fig. 2 and fig. 12, to conform to the shape of the back of the socket.

This disc E is described as centrally perforated, and the hole in the material is described as sufficient to enter the eyelet *l*, and the lower extremity of said eyelet is spread out against the interior surface of the socket D, and the latter is maintained in close connection with the fabric A^2, and the parts D, E, F, and *l* are firmly united, thus completing the other member or enclosing portion of the fastening fabric.

The eyelet is to pass through the polar centre of the cap, through a hole in the glove fabric sufficient to receive it, and through the polar centre of the socket, and is to bind all these parts together and hold the back of the socket and the interior of the dome washer or disc E firmly together, the fastening being at the polar centre of the disc E and the polar centre of the socket D.

Claim 4 asserts as the invention of Mead, —

"In a fastening device of the nature described, the enclosing portion [*i.e.*, the part which encloses the ball, or, in other words, the buttonhole member], composed of a hollow socket centrally secured to the

fabric by a button head, F, and with the enclosing portion disposed upon the under side of the flap, substantially as stated."

This claim is said by Mr. Quimby (p. 117) "to relate to the structure shown in fig. 2, in which the imperforate cap F is employed;" and as the defendant's button heads do not employ the imperforate cap F, they do not employ the invention referred to in the 4th claim of the Mead patent (p. 119).

The 6th claim of the Mead patent (p. 215) is for—

"a member of a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it is centrally attached to the fabric, substantially as set forth."

Mr. Quimby says, on page 117, that—

"The drawings show and the specification describes two modes of finish for the button head. In that illustrated in fig. 2, the button head is composed of the dished washer E covered by the imperforate cap F. In that illustrated in fig. 12, the imperforate cap is omitted, and the button head consists simply of the dished washer E. In both cases, the dished washer is necessarily present, because it is the thing which, by being riveted to the spring-mouthed socket, serves to fasten the structure to the glove flap, *the leather of which is squeezed by the exterior of the socket*

against the interior of the button head or dished washer E.

"The invention referred to in claim 6 is not limited to a combination employing the imperforate cap, but is present in a structure like that shown in fig. 12, in which the socket on the inner side of the glove flap is, by means of the rivet, combined with the button head on the outer side of the glove flap, irrespectively of whether said button head be composed of a double shell, to wit, the dished washer E and imperforate cap F, as shown in fig. 2, or a single shell, to wit, the dished washer E, as shown in fig. 12."

On page 119 he says, —

"The button heads of the Kraetzer fastenings are not provided with imperforate caps, and therefore, as I understand it, the said exhibits do not employ the invention referred to in the 4th claim of the Mead patent. They do, however, employ the invention referred to in the 6th claim of the Mead patent, because they employ in each case a hollow socket in combination with a rivet and button head, whereby the socket is centrally attached to the glove leather."

The 7th claim of the Mead patent (p. 215), is for —

"a member of a fastening device composed of a hollow socket, D, centrally attached by an eyelet, *l*, the latter resting upon or within an annular depression *q* formed in a concaved collet or disc, E, substantially for the purposes herein set forth."

The annular depression *q* is of a depth equal to the thickness of the metal forming the eyelet *l* (p. 214), and it is made to receive the flange of the eyelet and form a more perfect finish and prevent the edges from catching. This is all described by Mr. Quimby on page 117.

The 7th claim is limited by the condition that an annular depression should be formed around the edge of the hole through the dished washer, which is called in the claim "the concaved collet or disc E;" the purpose of which depression is to contain the outwardly turned flange of the rivet, so that the outer surface of the rivet flange shall be substantially flush with the outer surface of the dished washer, and the button head will thus be made to present a smooth exterior surface.

It appears in evidence that Kraetzer, the defendant, is patentee in two patents, No. 359,614 (p. 266), and No. 359,615 (p. 272), both of March 22, 1887, for the glove fastener which is pursued.

The answer admits (p. 8, ¶ xi.) that Kraetzer has made, used, and sold glove fasteners like the fasteners of patent 359,615, of March 22, 1887, of which he is exclusive proprietor.

It also appears in evidence (pp. 159, 160) that gloves having the Kraetzer fastener upon them were on the market during the trial of this cause, and that those fasteners are known in the trade as "Kraetzer fasteners" (Richardson, p. 160). They conformed

so well to the patent that defendant's expert declared them to be Kraetzer fasteners (p. 100, cross-int. 133).

It also appears that the defendant introduced in evidence the Kraetzer fastener (p. 72), the same being produced by his witness, Mr. Livermore, who says (p. 70), "I have several samples of the Kraetzer fasteners."

An examination of these exhibits shows, and an examination of the Kraetzer patents No. 359,614 and No. 359,615, on page 266 and 269, shows clearly that the Kraetzer device has a socket of substantially the same shape in its upper portion, namely, a hemisperical shape, as the Mead socket; that this socket has a hollow stem to it, answering to the barrel of the Mead eyelet; that there is a concavo-convex washer which exactly represents the disc E of the Mead patent. This concavo-convex washer and the back of the dome are compressed together in practice so as to centrally clamp the fabric between the inside of the washer and the outside of the dome.

Infringement.

Remembering that the answer admits the manufacture, use, and sale of glove fasteners by the defendant, made in accordance with and substantially like the invention shown and described in United States Letters Patent No. 359,615, dated March 22, 1887, granted to the defendant for improvement in glove fastenings; and remembering also that the

claims of the patent may be fairly relied upon to interpret the meaning of the word "invention," the glove fastener of the defendant, which consists of the outer cap A of the Kraetzer patent (p. 271, claim 1), having the central opening B surrounded by an annular cavity, the spring shell D provided with an annular shoulder, E, and closed top which is fitted within the said opening B and headed down to fill said cavity, and the spring ring H and spring retainer G connected together and secured in position, as shown and described, is the language of the first claim; and to ascertain what is meant by the "outer cap," we find on page 270 this language:

"In the Kraetzer patent, A represents the top shell or cap formed of sheet metal and provided with a central opening, B, surrounded by an annular depression or countersunk cavity, as shown in figs. 9 and 10. The said opening B is adapted to receive the upper end C of the spring shell D, which is then pressed down and somewhat flattened, so as to expand the end portion C, and cause it to fill the said cavity formed in the top surface of the cap A when secured in position on material forming one side portion of the opening or slit in the wrist of a glove, as shown in figs. 9 and 10."

Mead says, p. 214:

"By reference to fig. 12 of the drawing I have shown a slight deviation in the manner of finishing

the button portion of the fastener, as shown in fig. 2; but I do not consider this modification distinct from the spirit of my invention, nor embodying new matter, since it would ordinarily suggest itself to one skilled in the art to which it appertains. In case it is desired, the imperforate cap or button head F may be entirely removed, and by this means, although not securing a button finish, still the cost of making this part of the fastening is materially lessened. Supposing this form is adopted, the eyelet must be flush with the exterior surface of the disc E. The disc E is a concavo-convex piece of sheet-metal, which is more or less formed to the curvature of the socket member, and which goes on one side of the glove fabric, while the socket member goes upon the other side of the glove fabric. In order to present a more perfect finish, and at the same time to prevent the edges thereof from catching, I have formed an annular depression, *q*, in the top of said disc E of a depth equal to the thickness of the metal forming the eyelet *l*. Thus a smooth exterior surface is secured."

The cap, then, of the Kraetzer patented glove fastener, which the defendant admits that he has made, is a cap which has a central or polar opening in it surrounded by an annular depression exactly like the central or polar opening of the cap E, surrounded by an annular depression in the Mead patent in suit. In the Mead patent this annular depression *q* is of a depth equal to the thickness

of the metal which is to fit into it, and serve as an attaching flange to hold the cap and the socket together.

The depression or countersunk cavity of the Kraetzer device is, as stated on page 270, to receive the upper end C of the spring shell D, which is then pressed down and somewhat flattened so as to expand the end portion C, and *cause it to fill the said cavity* formed in the upper surface of the cap A when secured in position on the material.

The Mead cap and the Kraetzer cap are identical.

This top shell or cap is said to have a central opening, B, in Kraetzer's patent, and the disc E of the Mead patent is said to be centrally perforated (p. 214), and the perforation in the thing called the "top shell or cap" by Kraetzer, and the "disc E" by Mead, is a perforation in exactly the same place in the two devices. Each is, practically, a hemispherical shell pierced in the line of its polar axis. Around this polar perforation each has a small zone of depression, the depression being sufficient in both cases to imbed the flanged-out portion of the riveting shank, which unites the socket or active portion of the buttonhole member with the shell or dome-washer or cap, which is an essential, although a dormant and sedentary, rather than an active or mobile, member of the mechanism. In each case there is a socket or enclosing portion to this buttonhole member. This socket is in each case upon one side

of the fabric, with the convexity of its hemisphere presenting towards the fabric, and on the other side of the fabric is the cap or concave collet or disc with its concavity presented towards the fabric. The polar regions of these two hemispheroidal elements are arranged adjacent to each other, and the concavities of the two parts point in the same direction, and the union between the two members is made by a hollow shank which engages with the substance of each of the hemispheroidal parts in the regions adjacent to the pole. In other words, each has a cylindrical neck or reveting shank which spans the interval between the two hemispheroidal elements. It is drawn in the Kraetzer case from the substance of the socket portion of the structure. It is described in the Mead device as a rivet or as an eyelet. It was shown in the Dowler device as a riveting shank drawn from the cap.

Mead Claims and Kraetzer Device Compared.

The 7th claim of the Mead patent (p. 215) is, "A member of a fastening device composed of a hollow socket D centrally attached by an eyelet *l*." The hollow socket of the Kraetzer patent 359,615 is called "the spring shell," and is described as made of sheet-metal having a somewhat conical shape. The ball or stud enters into it and is enclosed by it just exactly as the ball or stud of the Mead patent enters into its socket and is enclosed by it.

The hollow socket of the Mead patent therefore exists in the Kraetzer device exactly in its upper portion, and substantially in its lower portion; exactly with regard to the attaching portion; by equivalency as regards its snapping or springing portions.

This "member of a fastening device composed of a hollow socket D" is said in claim 7 to be "centrally attached by an eyelet *l*." The attached part of the eyelet of Mead is in what is called the upper end C of the spring shell D. It is well described in the Kraetzer patent 359,614 of the same date of March 22, 1887 (p. 267):

"The spring case H or chamber shell enclosing the spring is composed of a somewhat conical eyelet or shell having an enlarged opening at one end, and provided with an internal annular shoulder *e*, and connected by a *semispherical* portion terminating in a contracted neck or tubular end portion adapted to fit closely within the opening or hole *c* formed in the said outer cap B when secured together, as hereinafter described."

The tubular end portion is the eyelet of the Mead patent.

Going back to claim 7 again, we have found "a member of a fastening device composed of a hollow socket D centrally attached by an eyelet *l*, the latter resting upon and within an annular depression *q*" (called by Kraetzer, on page 270, "an annular depression or countersunk cavity, as shown in figs. 9

and 10;" and called on page 271 "an annular cavity," in claim 1), "formed in a concaved collet or disc E" of the Mead patent, called by Kraetzer "an outer cap A having a central opening B surrounded by an annular cavity."

Claim 7 of Mead Clearly Infringed.

There can be no question that the 7th claim of the Mead patent is infringed by every Kraetzer fastener made under and according to the patent 359,615, which employs the dome-shaped cap A with the central perforation B, which central perforation B is surrounded by a countersink for receiving the outwardly turned flange of the attaching eyelet and barrel or reveting shank which unites the socket portion of the fastener to the cap portion of the fastener, and compresses the adjacent opposite surfaces of the central parts of said Kraetzer fastener upon the fabric to which the fastener is united.

Mead's Sixth Claim.

The sixth claim of the Mead patent, page 215, is a "perfect fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it, the hollow socket, is centrally attached to the fabric, substantially as set forth."

The rivet is undoubtedly fully represented by the

hollow attaching shank that exists in Kraetzer, and is called, on page 267, "a contracted neck or tubular end portion adapted tó fit closely within the opening or hole *c* formed in the outer cap," and which is called in the other Kraetzer patent, page 270, "the upper end C of the spring shell D."

The button head is undoubtedly a hollow concavo-convex hemispheroidal piece of sheet-metal, perforated at its polar region or *centre of the metal*, not of the form of the metal, *but of the substance;* and this which is called "a button head" by Mead in his claim, and which is shown in fig. 12 as "a part E," page 211, is exactly represented by the Kraetzer cap lettered in the patent 359,614 as B, and in the patent 359,615 as A.

The hollow socket referred to in the Mead patent is spoken of on page 212 as the "socket or hollow enclosing part B," and on page 213 as the "socket or hollow enclosing portion," and as the "active or socket portion," and as "D, a hollow socket provided with yielding sides" shown in figs. 5 and 6; and the purpose of this is explained on page 214, that "the interior or active portion of the socket or enclosing portion is not interfered with, and the ball member can easily enter its full diameter if so desired;" and the advantage of central fastening is set forth on page 214, "that the socket D is maintained in close connection with the fabric A', and the parts D, E, F, and I are firmly united,

thus completing the other member or enclosing portion of the fastening fabric."

These parts cannot be firmly united unless the upper portion of the socket conforms in shape very nearly to the internal shape of the concavo-convex cap or button head, and the uniting rivet rises from the centre of this dome-shaped hollow socket, and so unites it by its centre of substance to the button head. It is true Richardson united his hollow socket of Letters Patent No. 276,714, fig. 17, page 276, to the fabric by a flat tangential washer, but not a button head. It was Mead that combined the button head with the hollow socket, and thereby modelled the fabric to conform to the curved surfaces, and caused the pull upon it to be around a corner, which gave an advantage already described.

There can be no question, therefore, that the Kraetzer device as used embodies the invention claimed by Mead's sixth claim, and infringes it.

Errors Below.

Why did not the court below reach this conclusion? The opinion of the court is found on pages 348–350 of the present record. On page 349 the court says, —

"I do not understand that it is contended that either the cap or cup-shaped socket of Mead is new, or that an elastic mouth situated upon the under

side of the flap and secured by a button head at the other side of the flap, was not known in the art prior to the Mead patent."

This was not the issue.

It was contended, and is contended now, that an elastic mouth combined with and firmly united to a dome, *the mouth and the dome* being situated wholly on the under side of the flap and secured by a button head wholly on the upper side of the flap, was not known in the art prior to the Mead patent.

The court said, "The invention of Mead, it seems to me, must be limited to his form of socket combined with an imperforate button head." While Mead did not invent the socket, and while he did not invent the perforation at the centre of the socket, and while he did not invent the attachment of that socket to the fabric by a flat washer, the surface of which lay in a line parallel to the tangent line of the upper surface of the dome of the socket, he did invent the application of a curved or cup-shaped cap or dome washer in the place where a flat washer had previously been, and with an engagement similar to that of the flat washer at and around the riveting shank, but extended outward and over the surface of the dome and under the surface of the cap, which gave the important advantages of increased clamping suafaces and deflected line of draft.

Although the court must have seen that the difference between the Mead socket and the Kraetzer

socket was in the springing parts which did not serve to attach the socket to the fabric, and that the subject matter of the claims of the Mead patent related to the parts which did unite the socket to the fabric, and must have seen that Kraetzer's device did contain the dome-shaped upper portion which, in connection with the riveting shank, served to attach the active or springing part of each socket to the fabric, it held that the Kraetzer device does not contain the Mead socket, because it did not contain the springing part of the Mead socket or parts to be fastened on, although it did contain the fastening parts, which were the parts referred to by the claim.

This was the first specific error of the court assigned on page 351, and the court further limited the Mead claims to an imperforate cap, although Mead expressly described the perforated cap and made a claim to it.

The court's second error (p. 352) was that it declined to give proper weight to the similarity of construction of the upper part of the socket, by which it is attached to the fabric, and which is laid stress upon in the claim; but said, "I am not satisfied, upon the evidence, that there is any great advantage in pressing the fabric up into the button head." It is not necessary that there should be any *great* advantage, if there is any advantage. The thing itself is a small thing, and to require a pat-

entee to obtain a great advantage from a small thing is to demand more than the law has ever demanded.

Further, the court says, — and this is the third error, — that "this feature," namely, of pressing the fabric up into the button head, "*was present in the prior Dowler English patent, although it is not exhibited in the drawings.*"

The word "patent" must be used by a court with that reasonable degree of accuracy which confines it practically to the document of grant and explanation of grant.

If, therefore, this feature is present in the prior Dowler English patent and is not exhibited in the drawings, it must be spoken of in the text; and there is no word in the text of any such use or faculty of the Dowler device. On the contrary, it is distinctly said by Dowler, page 190, —

"The eye thus secured to the eyelet is fixed to the article by clinching the eyelet in the hole in the article, or the eye may be covered by a dome, the edge of which is joined to the head of the eyelet."

On page 191, he says, —

"The dome or cap of the eye part of the fastening is fixed to the material of the glove in the manner illustrated in fig. 3; that is, *the dome or cup is passed through a hole in the material from the back thereof, so that its ring b³ bears on the under side of the material.*"

The dome or cup above referred to is described on page 191 in these words: "The eye, fig. 3, of the fastening consists of a dome or inverted cup *b* perforated at top and having at its mouth a flange b^2, the dome or cup *b* being slightly contracted at *h* within the said flange." It is, therefore, much like the hollow socket of Mead with a horizontal flange run out from its lower edge, and this flange is inserted between the two sides of a metallic binding that goes over the edge of the flange very much as the binding of a coat goes over the edge of the coat.

This dome or cup, therefore, is described as passed through a hole in the material from the back so that its ring b^3, the binding ring referred to, bears on the under side of the material. The dome or cup *b* above the plane on the upper side of the material is then covered with a dome-shaped cap, *k*, the upper edge of which is eyeleted around the hole in the top of the dome or cup *b*, as seen in figs. 3 and 4, and marked *l*. There is no fabric between the cup *b* and cap *k*. As if this did not already distinctly state that the engagement between the fabric and the parts of the fastener was between the circumference of the flange at the bottom of the socket and the circumference of the flange at the bottom of the cap and not at the centre. Dowler goes on to distinctly state this fact:

"By the eyeleting of the cap *k*, the *material is gripped between the base of the said cap k* and the *ring* b^3 *at the mouth of the dome or inverted cap b*."

Dowler having excluded the idea of a central fastening, and having excluded the idea of moulding the cloth to conform to the space between the cap and the socket as distinctly and clearing as language would admit, the court finds, —

"I think this feature of moulding the fabric was present in the prior Dowler English patent, though it is not exhibited in the drawings."

This was clearly an error, and is assigned as the third error of the court below.

Mead did claim as part of his invention, and claim very distinctly in the fourth claim, that the hollow socket was centrally secured by a button head, and in the sixth claim, that the hollow socket was centrally attached to the fabric; and he explained that the socket was maintained in close connection with the fabric, and that the parts were firmly united. He did not, it was true, say that the reason why this is good is because the fabric is moulded to conform to the adjacent metallic surfaces, and that it is caused to pull around a corner against the sides of the rivet, and thereby is better: he simply said, "A central fastening is better than any other fastening." He did not give the philosophy of it; but he told how to make the parts to get the central fastening.

The court should have found that Mead did claim a central fastening and all the consequences of it; and in finding the other way made its fourth error.

The fifth error assigned is that the Kraetzer device did not contain the Mead socket, and therefore did not infringe the Mead patent; whereas it has been shown that the Kraetzer device did contain the Mead socket in the parts, and their relations by which the Mead socket was fastened to the fabric and to the cap by which it was fastened to the fabric.

In all the five assigned errors the court below was clearly wrong, and the judgment should be reversed.

Some evidence was given that it was possible to attach the Kraetzer device to the fabric in such a way that the parts should not be centrally engaged with the fabric or with each other, but, on page 99, C. I. 130, it appears that they are usually attached through a hole not much, if any, larger than would be required to receive the riveting neck of the socket piece, and it appears that the goods with Kraetzer fasteners upon the market during the examination, page 100, C. I. 133, have their fasteners so applied as to cover the whole socket up to the edge of the central hole in the button head, and to be rounded up over the back of the socket; and after having one such fastener examined and identified as the Kraetzer fastener, some more gloves were presented to him, and he was directed by counsel for the defence to refuse to answer whether

the fasteners on such gloves were Kraetzer fasteners or not. From this we can fairly see that the Kraetzer fasteners which were put upon the market were applied so as to infringe the Mead patent, and under the familiar doctrine of the Lamp Burner case, *Wallace* v. *Holmes*, 1 Off. Gaz. 117, 5 Fish. 46, 9 Blatch. 75, the manufacturer of such goods which are to be used in an infringing manner by the purchaser is liable to injunction.

The decree below should reversed, and the cause remanded, with directions enter a decree in favor of complainant, for injunction, profits, and damages, with reference to a master in usual form to ascertain and state the same, and adjudging to complainant its costs, to be taxed, and for further proceedings conformable.

Office Supreme Court U. S.
FILED.
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JAMES H. McKENNEY,
CLERK.

SUPREME COURT OF THE UNITED STATES.

OCTOBER, 1893.

No. 58.

THE BALL AND SOCKET FASTENER COMPANY,

APPELLANT.

v.

EDWIN J. KRAETZER,

APPELLEE.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

BRIEF FOR APPELLEE AND RESPONDENT.

Supreme Court of the United States.

OCTOBER TERM, 1893.

No. 58. IN EQUITY.

BALL AND SOCKET FASTENER CO., *Appellant*,

v.

EDWIN J. KRAETZER, *Appellee*.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF MASSACHUSETTS.

BRIEF FOR APPELLEE.

STATEMENT.

This is an appeal from the decree of the Circuit Court, dismissing the bill of complaint in this cause.

The bill of complaint as originally filed Jan. 27, 1887, alleged that the appellee infringed six Letters Patent of the United States as follows: (Bill printed, Rec., page 1.)

1. William S. Richardson, June 27, 1882, No. 260,050.
2. William S. Richardson, June 17, 1884, No. 300,508.
3. William S. Richardson, June 17, 1884, No. 300,509.
4. William S. Richardson, June 17, 1884, No. 300,510.
5. Albert G. Mead, Sept. 8, 1885, No. 325,688.
6. William S. Richardson, Sept. 8, 1885, No. 325,698,

all of which are for alleged improvements in glove fasteners.

The appellee, on May 13, 1887, filed a plea (Rec., p. 4), alleging that the bill of complaint was multifarious, in that an examination and comparison of the said patents disclosed the fact that they were patents for six separate and distinct devices which were incapable of being embodied in one and the same fastening or device. The appellant joined issue on this plea, May 3, 1887, and evidence was taken thereon,

which evidence is set forth in the record of this suit. (See pp. 33–39.) Just prior to the hearing on this plea and the evidence taken in relation thereto, the appellant served on the appellee a notice of a motion to discontinue as to two of the said Letters Patent, viz., the Richardson patents Nos. 260,050, and 325,698. (See Rec., page 5.)

It was admitted by the counsel for the appellant on the argument of the motion that the bill was multifarious.

The motion of appellant to discontinue as above was allowed and the following order made thereon: —

ORDER OF COURT.

> "Colt, J. Motion granted; the complainant to pay costs, to which the defendant has been put by reason of including the above-named patents in his bill, such costs to include all the costs of taking evidence to date." (See Rec., page 5.)

The bill as amended by the above discontinuance still contained four patents, and was as clearly multifarious, and for the same reasons, as when originally filed. The appellee would have filed another plea of multifariousness to the bill as amended had he not been advised that the expense would be less to meet all four patents on their merits. Accordingly an answer was filed April 20, 1888. (See Rec., page 6.)

In this answer the appellee suggests and charges that the bill is still multifarious, and for this reason the appellant is not entitled to an injunction, account, damages, or other relief.

By agreement of counsel the evidence taken for the appellant on the plea stands as appellant's *prima facie* case, and the evidence taken for the appellee on the plea stands as a part of the appellee's evidence on the answer. (See page 113.)

The appellee is manufacturing glove fasteners under Letters Patent No. 359,614 and No. 359,615, granted to him March 22, 1887, for improvements in glove fasteners. (See appellee's Exhibit Kraetzer Patent, pages 266 and 269.)

At the May term, 1889, the cause was fully heard on the pleadings and proofs taken thereunder by his Honor Judge Colt, and thereafter Sept. 18, 1889, the opinion of the Court was rendered (Rec., page 348), in accordance with which a

final decree was entered dismissing the bill of complaint in this cause at appellant's costs. (Rec., page 13.)

From this decree the appellant appealed, assigning five errors confined solely to the Mead patent No. 325,688, of Sept. 8, 1885. (Page 211.)

No appeal was taken from the decree of the Circuit Court dismissing the bill of complaint, as to the Richardson patents, No. 300,508, No. 300,509, and No. 300,510; hence this appeal involves only a consideration of the Mead patent.

JOINDER OF ERRORS.

The five errors assigned are (page 351): —

1. In that the Circuit Court limited the button-hole member of the Mead patent, No. 325,688 (page 211), to a socket member of precisely the form shown in the Mead patent combined with an imperforate button head.

In this there was no error, his Honor Judge Colt very correctly found. (Page 349.)

> "The socket of Mead is composed of a cup-shaped washer with curved wings. It is applied to the interior of the glove flap, and it is secured to the exterior washer or button head by a central rivet passing through a hole in the glove flap. I do not understand that it is contended that either the cap or cup-shaped socket in Mead is new, or that an elastic mouth situated upon the under side of the flap and secured by a button head at the other side of the flap was not shown in the art prior to the Mead patent. The invention of Mead, it seems to me, must be limited to his form of socket, combined with an imperforate button head. The Kraetzer device does not contain the Mead socket, and therefore does not infringe the Mead patent."

The state of the art admitted of no other interpretation and conclusion.

The Mead socket centrally fastened to the under side of the fabric was confessedly old, as admitted by Mr. Quimby, the appellant's expert, who says (page 116), "Of itself this spring socket was not new." But quite irrespective of the limitation imposed by Judge Colt upon the button-hole member of the Mead fastener, it is not to be denied that the

claims of the Mead patent under consideration specified a spring flanged socket as an essential element, which element is not found in the Kraetzer fastener.

The state of the art before Judge Colt so far as necessary, for a consideration of this assigned error, is reviewed by appellee's expert, Mr. Livermore, at page 43 of the record, and is shown in the following Letters Patent:—

UNITED STATES LETTERS PATENT.

No. 60,217, Mauvas, 1866, Record, 324.
No. 79,800, Abbott, 1868, Record, 221.
No. 3,421, Somers & Atwood, 1869, Record, 289.
No. 233,060, Wright, 1880, Record, 310.
No. 181,979, Platt, 1876, Record, 274.
No. 178,726, Brown, 1876, Record, 291.
No. 180,938, Schnopp, 1876, Record, 296.
No. 227,440, Mead, 1880, Record, 272.
No. 244,632, Loewenthal, 1881, Record, 315.
No. 241,767, Whitby, 1881, Record, 317.
No. 252,311, Goulding, 1882, Record, 251.
No. 260,411, Pringle, 1882, Record, 233.
No. 276,714, Richardson, 1883, Record, 276.
No. 260,050, Richardson, 1882, Record, 198.
No. 306,021, Kraetzer, 1884, Record, 262.

BRITISH LETTERS PATENT.

No. 1,450 of 1870, Schloss, Record, 179.
No. 809 of 1877, Bayer, Record, 182.
No. 795 of 1883, Dowler, Record, 187.

FRENCH LETTERS PATENT.

No. 95,127 of 1872, Schloss, Record, 176.

The correctness of Judge Colt's finding, but not his conclusions, are admitted by appellant at page 37 of its brief. The appellant there admits that Mead *did not invent the socket* nor the *perforation at the centre of the socket, nor the attachment of the socket to the fabric by a flat washer*, but asserts that he did invent the application of a cup-shaped cap or dome washer in place where a flat washer had previously been. But Mead did not invent a cup-shaped washer or cap, that is shown in nearly all the prior patents,

neither did Mead invent the application of a cup-shaped washer with an engagement of the fabric around the riveting shank, extending over the surface of the dome and under the surface of the cap. The dome cap of Dowler is exactly like that of Mead, and is, in each case, centrally attached to its socket in precisely the same way.

2. In that the Circuit Court declined to give weight to the "*pressing the fabric into the hollow of the button head.*"

In this likewise there was no error. In considering the question his Honor Judge Colt said (Opinion, Rec., pages 349, 350) :—

> "The complainant seeks to extend what appears to me to be the legitimate scope of the Mead patent upon the theory that the spring mouthed socket of the Mead presses the leather upward into the button and squeezes the leather against the inner surface of the button; that this feature, in connection with the fact that the hole in the flap need not be any larger than the diameter of the rivet, introduces an important element of strength which is found for the first time in the Mead device.
>
> "There are several reasons why this theory does not impress me with the importance with which it does the complainant. In the first place I am not satisfied upon the evidence that there is any great advantage in pressing the fabric up into the button head; in the second place, I think this feature was present in the prior Dowler English patent, although it is not exhibited in the drawings; and thirdly, *Mead, himself, does not seem to consider this feature of sufficient consequence to claim it as a part of his invention.* Before the Court should give such a broad construction to the Mead patent as to include something not mentioned by the patentee, as a part of his invention, it should certainly clearly appear that the improvement was a substantial one, and that it is not found in any prior device."

Mead makes no mention in his patent of this now much asserted feature of "*pressing the fabric*," and when examined as a witness herein, he testified (Rec., page 101) :—

> "*Int.* 6. Did you contemplate, in describing your invention as set forth in complainants' patent No. 325,688,

in the attachment of the fastener to the fabric, any stretching of the leather, or any effect other than is produced when two parts are fastened together by an eyelet?

"*Ans.* I did not.

"*Int.* 7. Did you contemplate, in describing your invention as set forth in complainants' patent No. 325,688, in the attachment of the fastener to the fabric, that the hole in the fabric should be limited to any particular size?

"*Ans.* I did not."

Exactly the same effect upon the fabric takes place in the Dowler device that is claimed for the Mead device, whenever the hole in the fabric is the same size. In attaching fasteners of the Mead class to a fabric it is, as Mead himself says, the custom to vary the size of the hole according to the fabric (page 102).

"*Int.* 8. Will you please state whether or not it is possible to always make the hole of the same relative size in attaching the fastener shown in complainants' patent 325,688, to the fabric, and give your reasons for any opinion you may express, or what your experience has been?

"*Ans.* The size of the hole would depend on the material to which it is fastened. On soft material, with a small hole, it would readily conform to the parts between which the material is held, while, in thick or stiff material, it would be necessary to make the hole materially larger, as the thick or stiff material would not stretch or conform to the two parts of the fastening."

There is no contradiction of this testimony in the record. There is not a single word in the Mead specification in any way suggesting this squeezing theory, and as seen above; Mead, the inventor, never heard of the theory, till it was squeezed into this case by the appellant's counsel and expert Quimby, and he was on cross examination forced to admit that the patent made no mention of it; he says (p. 154): —

"*Cross-Int.* 136. In short, then, you do not find a single word in the whole specification asserting the advantages which you allege nor any statement that squeezing the glove leather up into the recess of the button head was a new thing.

"*Ans.* I do not."

3. In that the Circuit Court declared that "*This feature* (the pressing of the fabric up into the button head) *was present in the prior Dowler English patent, though it is not exhibited in the drawings.*"

Nor was there error in this. The Court said: "*in the second place, I think the feature was present in the prior Dowler English patent, although it is not exhibited in the drawings.*"

It must be remembered that *this feature*, the squeezing of the fabric, is a mere function which occurs, if it occurs at all, when the fastener, having a central attachment, is applied in a particular way; that is, when the hole in the fabric is about the size of the central attaching eyelet.

The phrase "*centrally attached*," used in appellant's patent applies to the *socket*, irrespective of the fabric, and a socket is *centrally attached*, when it is riveted through its centre to its button head or dome.

A mere inspection of the English Dowler patent shows that its socket is centrally attached to its button head or cap; and how the fabric is situate between the socket and cap depends entirely on the size of the hole in the fabric; in other words in two structures so nearly alike, as the Dowler and the Mead, the action of the parts on the fabric must be similar.

The buttonhead or cap of the Mead and Dowler fasteners are confessedly alike, and appellant in its brief says, pages 18 and 21, "*this socket of Dowler's or inverted cup, is substantially the Richardson socket of Richardson's American patent, No.* 296,714." "*In this* (the Mead patent, 325,-688), *he provides to use what is substantially the Richardson socket of Fig.* 17, *Letters Patent No.* 276,714"; that is, the appellant maintains that the Dowler socket and Mead socket are substantially alike; according to the appellant's own contention, the Dowler and Mead fasteners are substantially alike, and certainly his Honor, Judge Colt was right in believing what was a function in one must be a function in the other. How can it be doubted that "*this feature*" must be present in the prior Dowler English patent, if it is present in the Mead patent? Certainly Dowler is entitled to have this feature, if his structure will enable him to possess it, as much as Mead, and it does.

Whatever difference there may be it is simply one of

degree; that is, the extent to which the fabric is pressed up into the dome, depending entirely upon the size and shape of the hole in the fabric. A mere inspection of the Dowler socket and cap shows that whatever the effect is on the fabric in the Mead fastener, the same effect must be in the Dowler fastener, under like circumstances.

4. In that the Circuit Court declared that "Mead himself does not seem to consider *this feature* of sufficient consequence to claim it as part of his invention."

The correctness of this finding is beyond question as a reading of the patent shows. It is not described in the body of the specification, or claimed in the claims, in fact, no intimation of this feature, or theory, is found in the Mead patent. Mead himself denies that it is any part of his invention. The alternative constructions described in the Mead patent, wherein it is stated that the button head may be flat, all show that this theory exists only in the mind of appellant's counsel and nowhere else.

Appellant's expert, Quimby, says (p. 154): —

"*Cross-Int.* 136. In short, then, you do not find a single word in the whole specification asserting the advantages which you allege, or any statement that squeezing the glove leather up into the recess of the button head was a new thing?

"*Ans.* I do not."

5. In that the Circuit Court found that the Kraetzer device made by the defendant does not contain the Mead socket and therefore does not infringe the Mead patent.

Both the finding and conclusion were correct.

The Circuit Judge, describing the socket of Kraetzer, said,—

> "*The spring which engages the button member of the Kraetzer fastener is a ring of wire split on one side so as to be capable of expansion. This spring ring is held loosely in a chamber composed of two pieces of metal united around their edges, one of which has a tubular extension which passes through the fabric, and is engaged with the cap, or button head on the other side of the fabric*" (p. 348).

This Kraetzer socket is not the Mead socket, which is composed of a cup-shaped washer with curved wings. Especially must this be true, when both the socket and imperforate cap of Mead were old; not new in any sense with Mead.

Appellant's expert, Mr. Quimby, says,—

> "The features of the Mead fastening particularly referred to are the fourth, sixth and seventh claims of the patent in here in the construction and manner of application of the socket portion of the fastening to the overlapping glove flap."
>
> "The socket portion is composed of a dished washer or shell recessed upon its under side, and applied to the exterior of the glove flap, and a cup-shaped washer provided with spheroidally curved wings, and applied to the interior of the glove flap, and secured to the exterior washer or button head by a central rivet passing through a hole in the glove flap, which hole need not be any larger in diameter than the rivet is, and is hence permitted to be of much smaller diameter than the knob is. . . .
>
> "Of itself this spring socket was not new, but was one of a class of prior existing glove fastener sockets having spring mouths, adapted to yield to admit a knob and then to contract against the neck of the knob. The new thing in structure referred to in the fourth, sixth and seventh claims of the Mead patent is *that the spring-mounted socket pressed the glove leather upward into the button head, and squeezes the leather against the inner surface of the button head.*" (p. 116.)

Mr. Quimby also says: —

> "It was not new with Mead to apply to the overlapping flap of a glove a spring socket with its mouth opening outwardly to receive a knob affixed to and projecting downwardly from the underlapping glove flap, and it was not new to fasten such a socket to the overlapping glove flap by a central eyelet or rivet." (p. 153.)
>
> "*Cross-Int.* 26. Do you find, in your opinion, that the Kraetzer fastener embodies the new thing, namely, the cup-shaped socket with spheroidally curved wings?
>
> "*Ans.* I do not." (p. 128.)

In no sense does the Kraetzer fastening embody the spring flanged socket of the Mead patent, which is an essential element of the sixth and seventh claims alleged to be infringed.

Hence there is no infringement.

THE DEFENCES RELIED ON ARE:

1. Anticipation.
2. Non-patentability in view of the prior art.
3. Non-infringement.

ARGUMENT.

This appeal involves a consideration of the sixth and seventh claims of the Mead patent No. 325,688 (page 211), which was granted for alleged improvements in metallic button fasteners, used largely on gloves, consisting of what is termed in the art a button member, attached to one flap of a garment, and a buttonhole member attached to the other flap. The above specified claims relate solely to the buttonhole member.

APPELLANT'S MEAD FASTENER.

The members of the Mead fastener correspond to an ordinary button and buttonhole; the button member, or stud, passes through a slightly contracted opening in the buttonhole member, one or the other of said members being made elastic or resilient, so as to permit the button or stud to pass through the contracted opening, which, in the case of an elastic buttonhole member, yields or expands to permit such passage and afterwards contracts around the neck of the button member or stud, so as to retain the two members together, until pulled apart.

All the prior United States English and French patents show various ways of constructing and attaching a metallic fastening having these general features.

In the Mead fastener the button member is a spherical non-elastic stud or ball, and the the buttonhole member is elastic. The elastic buttonhole member of Mead, shown in Fig. 2 of the Mead patent, at page 211, consists of an *imperforate* cap or *button head* F and elastic socket D. These two pieces are attached to the flap of a garment by the eyelet *l*, the cap or button resting on the upper side of the flap and the socket below. The Mead patent shows in Fig. 12 the socket

D attached by eyelet *l* to what the specification calls a perforate disk E without the imperforate cap F.

It is stated in the Mead specification, page 213.

> "D represents, in Figs. 5 and 6, diametrical cross-sections of a hollow socket provided with yielding sides. This form of socket has heretofore been secured to the upper side of the fabric by a lateral arm, which does not present a neat or ornamental finish, and is liable to catch and be torn from the article. Hence I propose to radically change the position thereof and employ the active or socket portion below the fabric, and dispose an ordinary fastening eyelet *l* through the socket D. This eyelet is located centrally of the socket, and when this part of the fastening is completed is secured, and rests at its top between the cap or button head F, which surrounds the whole and the disk E, while its lower extremity is similarly upset upon and over the interior periphery of the socket D. *The disk E may be a flat plate;* but in the present instance I have shown its outer edge or circumference bent in order to approximate to the general shape of the button head when the latter is pressed into its finished form, and thus it strengthens said cap."

The button head F is shown in Fig. 4, the socket D in Fig. 5, page 211.

The button head consists of three parts: the button shaped cap F, the centrally perforated disk E, and the attaching eyelet *l*.

The socket D is thus described by appellant's expert, Mr. Quimby, page 116: —

> "A cup shaped washer provided with spheroidally curved wings. . . . The cup shaped washer, with its wings curved slightly inward at their lower edges, and thus presenting a contracted but outwardly yielding mouth, constitutes the spring socket for receiving and holding the knob."
>
> "*Of itself, this spring socket was not new*, but was one of a class of prior-existing glove fastener sockets, having spring mouths."

APPELLEE'S KRAETZER FASTENER.

The alleged infringing Kraetzer fastener is found in United States Letters Patent 359,614 and 359,615, at pages 266 and 269.

It consists of a non-resilient stud member and a resilient buttonhole member.

The buttonhole member, with which we are alone interested, consists of a perforated top shell or cap shown at Fig. 4, page 266, and a shouldered chamber shell inclosing a coiled wire spring.

This Kraetzer spring retaining chamber has an annular shoulder E at its base and a contracted neck at its top.

The spring that engages the button member of the Kraetzer fastener is a coiled-wire ring, split on one side, so as to expand as the button passes through it. This spring ring is not fastened directly to the fabric, but is loosely held in its chamber. The spring ring of the Kraetzer fastener is incapable of co-operating with the button head or stud unless it be inclosed in and loosely connected with the spring chamber, which alone is capable of being attached to the fabric. The spring chamber is composed of two pieces of metal united around their edges, one of which has a tubular extension which passes through the fabric and is engaged with a cap or button head on the other side of the fabric.

Where the resiliency of a buttonhole member is in the socket itself, as in the Mead socket, which is directly attached to the fabric it is easily impaired and interfered with, as the expanding and contracting has a tendency to impair its action. In the Kraetzer fastener the part which engages the button head or stud serves no other purpose whatever, but rests loosely in the chamber of its holder. This spring holder or shell is clamped permanently and firmly to the fabric, and is never expanded or contracted as in the Mead socket, in engaging and disengaging the parts of the fastening, the wire ring alone expands and contracts. This enables the spring ring of the Kraetzer fastener to be made of the best possible elastic metal, while the holder or spring chamber, with its tubular extension, can be made of low brass easily worked.

STATE OF THE ART.

Appellant's expert, Mr. Quimby, speaking of the Mead fastener says: —

> "Of itself, this spring socket was not new" (page 116).
>
> "It was not new with Mead to apply to the over-lapping flap of a glove, a spring socket with its mouth opening downward to receive a knob affixed to and projecting outwardly from the under-lapping glove flap, and it was not new to fasten such a socket to the over-lapping glove flap by an *eyelet or rivet*" (page 153).

His Honor, Judge Colt, said: —

> "I do not understand that it is contended that either the cap or cup-shaped sockets of Mead is new, or that an elastic mouth situated upon the under side of the flap and secured by a button head at the other side of the flap, was not shown in the art prior to Mead" (page 349).

Mr. Quimby, at page 147 of the Record, Cross-Int. 103, also says that the buttonhole member of the Mead patent No. 325,688 is a metallic glove fastener in which a bulbous projection or button secured to one flap of a glove is seated in a laterally yielding spring socket affixed to the other flap of a glove, and that this type of glove fastening was old in the art long before 1883, and that examples of it were shown and described in the British patent to Schloss, No. 1,450, of the year 1870; British patent to Bayer, No. 809, of the year 1877; United States patent to A. G. Mead, 227,440, dated May 11, 1880, and United States patent to E. Pringle, dated July 4, 1882.

Appellee's expert, Mr. Livermore, has very fully discussed the English patents of Schloss, Bayer and Dowler in his testimony (pages 60–68), and gives it as his opinion that unless the parts referred to in the sixth and seventh claims of the Mead patent are restricted to exactly the elements shown therein, such claims would include the fasteners of the Schloss, Bayer and Dowler English patents.

Mead in his patent, 227,440, of 1880, page 272, and Pringle in his patent in 1882, page 233, both show an elas-

tic buttonhole member provided with a coiled wire spring, neither the Mead nor Pringle springs are rigidly connected with or form a part of the same piece of metal as the socket, but are independent springs, each has a central attachment. It is thus seen that Mead had in 1880 used a central attachment with a wire spring in the spring chamber. This is four years prior to his patent in question.

Mauvas, 1866, page 324, shows an elastic buttonhole member, provided with an imperforate cap and spring-containing chamber.

Platt, 1876, page 274, shows an elastic buttonhole member, wherein the elasticity is attained by breaking the continuity of the annulus.

The Schnopp patent (p. 296) shows a buttonhole member having a socket with spring sides.

In the Kraetzer patent, No. 306,021, page 262, Figs. 7 and 1 is shown a spring-flanged socket attached to an imperforate cap by a central attachment. The imperforate cap or button head is on the upper side of the flap and the socket below.

Whitby 1881, No. 241,767, page 317, shows a glove fastening, both members of which are attached to the fabric by a central attachment, the elastic button member having a central attachment after appellant's rigid construction. The washers used in this fastener, all show the annular depression q, spoken of as a feature in the Mead patent: see washers K, Fig. 1, page 317.

Goulding, 1882, No. 252,311, page 251 shows a spring button attached to the fabric by a central attachment. A comparison of Fig. 3 of this patent page 251, with that of the much talked of Fig. 17 of the Richardson patent 276,-714, page 276 shows there was nothing novel in what Richardson did. Goulding antidates Richardson by a year.

All that Mead meant by central attachment was, that in place of using a cup shaped socket on the end of an arm, as shown in the Richardson patents, pages 276 and 198, he desired to attach the socket through its centre. But unfortunately for him he was not doing anything new.

Mead thought his stud in this patent in question, No. 325,688, was new, and speaks of it as centrally attached, the same as he does of his socket, bat it was old, and is all clearly shown in the Platt patent 1876, p. 274.

The first, second and third claims of the Mead patent 325,-

688 are for the stud or button member of a device, and Mr. Quimby has admitted that each one of the claims covers exactly the stud or button of the Platt patent of 1876, No. 181,979. (*See p.* 274.) (*See Cross-Int. and Ans.* 118, 119, p. 150.)

This shows how careless the examiner in charge was in allowing the claims of this Mead patent 525,688.

Wright No. 233,060 of 1880, page 310, shows an elastic buttonhole member, consisting of a coiled wire spring in a chamber, attached to the fabric by a central attachment and a dished washer, see Figs. 1 and 3. The fabric is pressed up into the cup-shaped or dished washer, and is thus described in the specification, "*The material E being thereby firmly embedded in the washer F.*"

The Schloss English patent, page 179, Figs. 6 and 12, shows a socket rounded over and made elastic by a set of slits.

The Schloss French patent, page 176, Figs. 13 and 14, has a buttonhole member provided with an elastic plate and a central attachment.

The Bayer English patent No. 809, of 1877, page 182, shows a buttonhole member provided with a split ring, which expands and contracts like the Platt fastener, page 274.

The Dowler English patent, No. 795, page 190, Figs. 3 and 7, shows a buttonhole member which closely resembles in construction and operation the Mead fastener.

We have here a perforated cap with integral central attachments, and a spring flanged socket of almost the identical construction of Mead. This Dowler fastener is almost identical with the modification of the Mead fastener shown in Fig. 12 of the Mead patent in consideration.

The state of the art confessedly shows that Mead's alleged improvement relates to an old class or type of fasteners — that all the elements are old, namely, the socket, the button head, as illustrated in Kraetzer patent 306,021, in Bayer British patent 809 of 1877, and Dowler British patent, No. 795 of 1883, and the common fastening eyelet *b*.

ANTICIPATION.

Confessedly the Mead fastener is old; appellant's expert, Mr. Quimby, admits that,

> "Of itself this spring socket was not new." (Page 116.)

> "It was not new with Mead to apply to the overlapping flap of a glove a spring socket with its mouth opening outwardly to receive a knob affixed to and projecting downwardly from the underlapping glove flap; and it was not new to fasten such a socket to the overlapping glove flap by a central eyelet or rivet." (Page 153.)

The buttonhole members shown in the Kraetzer patent, No. 306,021, page 262, and in the Dowler British patent of 1883, substantially anticipate the Mead buttonhole member.

The feature of pressing or moulding the fabric, so as to have the fabric pulled around a corner, was not new with Mead; it is clearly shown in the Wright patent, No. 233,060, 1880, page 310, and in the Kraetzer patent, No. 306,021, 1884, page 262.

PATENTABILITY.

Confessedly, the elements themselves of the Mead buttonhole member are all old.

The appellant's expert, Mr. Quimby, says, page 116:—

> "The new thing in structure referred to in the fourth, sixth and seventh claims of the Mead patent is *that the spring-mouthed socket presses the glove leather upward into the button head, and squeezes the leather against the inner surface of the button head.*"

It will be seen from an examination of the Mead patent, in connection with the prior state of the art, that the novelty of the Mead invention, if any there is, depends entirely upon details of construction and arrangement.

Mead was in no sense a pioneer, being simply an improver of the very lowest order, not rising, as we contend, to the dignity even of an inventor.

But pressing the fabric by a spring-mouthed socket into a button head or dished washer, must happen in the Dowler English fastener and is clearly shown in the Wright patent No. 233,060, of 1880 (page 310), Fig. 1. Wright has a socket attached by a central fastening, as rigidly interpreted by appellant, to a dished washer and thus describes it in his specification.

The washer F in the Wright patent is *dish or cup shaped* and the material is actually described as embedded or moulded in the washer F.

"The outer shell is provided with a tubular neck C, to receive the stud or pin D (shown in Fig. 9), and constituting the other portion of the fastener. This neck C is passed through one part of the garment on which it is intended to fasten. A washer F slightly larger than the cylinder B is now passed over the neck C which is then clinched or riveted over it; the material E, *being thereby embedded in the washer F*, and thus firmly secured between it and the cylinder B.

"Instead of clinching the neck C a thread may be cut thereon and a *dish-shaped nut* made use of."

The only novelty claimed by the appellant in the Mead device is

"*That the spring-mouthed socket presses the glove leather upward into the button head, and squeezes the leather against the inner surface of the button head.*"

There is nothing patentable in this; it is merely an accident due to particular construction. It is a finely spun bit of expert testimony to resuscitate a defunct combination. It is a result, not the means; a mere function incident to a particular construction, which construction or means is old. A mere function, effect or result is not patentable.

In Corning *v.* Burden, 15 How. 252, Mr. Justice Grier said,—

"But it is well settled that a man cannot have a patent for the function or abstract effect of a machine, but only for the machine which produces it."

In Fuller *v.* Yentzer, 94 U. S. 288, Mr. Justice Clifford said,—

"Patents for a machine will not be sustained if the claim is for a result, the established rule being that the invention, if any, within the meaning of the Patent Act, consists in the means or apparatus by which the result is obtained."

The state of the art clearly shows that the elements of the buttonhole member of the Mead fastener were old, and had been combined in substantially the same way as Mead combined them.

His Honor, Judge Colt, said, opinion, page 349:—

> "I do not understand that it is contended that either the cap or cup-shaped socket of Mead is new, or that an elastic mouth situate upon the under side of the flap, and secured by a button head at the other side of the flap was not known in the art prior to the Mead patent."

There is certainly nothing patentable in the sixth and seventh claims of the Mead patent.

THE ALLEGED ADVANTAGES OF THE SO-CALLED CENTRAL ATTACHMENT.

There is something almost humorous in the tenacity and persistency of the appellant to find in one, at least, of the six patents set up in its bill of complaint, something novel which the appellee infringes.

Reduced to fighting only on the Mead patent, compelled to abandon by its own expert the fourth claim of the Mead patent, confessing that all the elements of the sixth and seventh claims, on which it finally relies, are old, it finally asks to have its claims sustained, because of the alleged advantages of central attachment.

Although *central* attachment is not new with Mead, what results does the appellant say accrue from this?

First. That the hole of the assembling rivet is smaller than the socket.

Second. That the material was moulded.

Third. The strain was indirectly applied.

While all these results appear in the prior patents to Richardson, Kraetzer, Wright, Schloss and Dowler, what benefits arise from these results?

The appellant says these results give greater strength. But there nowhere appears in the record any testimony of the necessity of great strength in a glove fastener, or that prior to Mead they were not strong enough. As a matter of fact there was as much need of greater strength in glove fasteners at the date of Mead's alleged invention, as there is for a steamer's hawser, and a snubbing post to aid in drawing on one's gloves.

There is not a particle of evidence in the record of the advantage of pressing the fabric up into the button head, or that this advantage is recognized by the trade or that by

reason thereof there has been extensive use of the fastener; there is no testimony to show that the alleged improvement is a substantial one, and Mr. Livermore says that it is a disadvantage (page 93).

The best internal evidence that Mead had no idea of the squeezing of the fabric is shown in the fact that he says the disked cap may be flat or that a capped eyelet may be used in place of a disked cap.

This stretching and squeezing theory of the Mead patent is an absolute objection, and not a benefit. If, as the appellant contends, a fastener is more firmly and strongly attached when the material is stretched and squeezed as described, it is difficult to see how this avails, if it is strongly enough attached without it. There is no necessity for the fastener to be attached any more strongly than it is attached in any one of the forms of fasteners shown in the prior state of the art. When you have all the strength and firmness required it is hard to see what benefit there is in doubling its strength or firmness. One of the strongest arguments which can be brought forward to show the absurdity of this stretching and squeezing theory of the appellant is that the appellant has practically abandoned the use of the dished washer of the shape shown in the Mead patent, and now uses a washer which is nearly flat, and with which there can be no more squeezing or stretching than is found in any one of the prior structures. But of what moment is it whether the appellant or the appellee makes use of this squeezing and stretching?

It is not the invention of Mead and no mention is made of it in the Mead fastener.

CONSTRUCTION OF THE SIXTH AND SEVENTH CLAIMS OF THE MEAD PATENT NO. 325688.

The appellant does not contend that there is any novelty in the structure itself of the buttonhole member of this Mead patent. Mr. Quimby, its expert, says of it:—

> "The socket portion is composed of a dished washer or shell recessed upon its under side, and applied to the exterior of the glove flap, and a cup-shaped washer provided with spheroidally curved wings, and applied the interior of the glove flap, and secured to the exterior

washer or button head by a central rivet passing through a hole in the glove flap, which hole need not be any larger in diameter than the rivet is, and is hence permitted to be of much smaller diameter than the knob is. . . .

"Of itself this spring socket was not new, but was one of a class of prior existing glove-fastener sockets having spring mouths, adapted to yield to admit a knob and then to contract against the neck of the knob. The new thing in the structure referred to in the fourth, sixth and seventh claims of the Mead patent is *that the spring-mouthed socket presses the glove leather upward into the button head, and squeezes the leather against the inner surface of the button head.*" (Page 116, Ans. 5.)

Mr. Quimby also says: —

"It was not new with Mead to apply to the overlapping flap of a glove a spring socket with its mouth opening outwardly to receive a knob affixed to and projecting downwardly from the underlapping glove flap, and it was not new to fasten such a socket to the overlapping glove flap by a central eyelet or rivet." Page 153.

In other words, Mr. Quimby admits that the Mead structure is absolutely old, and that the only novelty contended for in the Mead device is that the spring-mouthed socket presses the glove leather upwardly into the button head, and squeezes the leather against the inner surface of the button head. Mr. Quimby admits that this "new thing" is not shown or described or even hinted at in the Mead patent.

"*Cross-Int.* 136. In short, then, you do not find a single word in the whole specification asserting the advantages which you allege, nor any statement that squeezing the glove leather up into the recess of the button head was a new thing?

"*Ans.* I do not." (See page 154.)

Mr. Livermore also says: —

"I will add that I am unable to find, although I have looked for it most carefully, anything whatever in the Mead patent that in any way indicates that the conforming of the fabric to the back of the socket formed any part of the Mead invention, or is a necessary result of these essential features of the structure of the Mead

fastener that are described and claimed." (See page 77, bottom.)

Mr. Quimby also admits that there is nothing said in the Mead patent about the size of the hole to be made in the fabric to which the fastener is to be attached. Mr. Livermore says, referring both to the Mead and the alleged Kraetzer infringing fastener, that the size of the hole would depend largely on the judgment of the person who applied the fastener. The testimony of Mr. Quimby substantiates this position. It is for any glove manufacturer to use his discretion in making the hole larger or smaller in accordance with the thickness or thinness of the material which he was using, it being obvious that on a very thick material a larger hole would and must be used than on thin or sleazy material.

This theory in regard to the Mead patent is exploded in a single word by the specification itself. It is obvious that this pressing of the glove leather upward or squeezing spoken of could only take place where a dished washer or cap was used. The specification specifically states that the dished washer or cap E might be a flat plate, this language being used in the specification: —

> "The disk E may be a flat plate; but in the present instance I have shown its outer edge or circumference bent in order to approximate to the general shape of the button head when the latter is pressed into its finished form, and thus it strengthens said cap."

The statement of the Mead specification is unequivocal and plain, and would be absurb and nonsensical if it did not mean just what it says. The drawings show a dished washer. The patentee desires to state that the dished washer may be a flat plate, and the only purpose and object of the statement is to make it clear that a flat plate could be used in place of the dished washer E.

Mr. Mead was asked to answer the following interrogatories (page 101): —

> "*Int.* 6. Did you contemplate, in describing your invention as set forth in complainant's patent No. 325,-688, in the attachment of the fastener to the fabric, any stretching of the leather or any effect other than is produced when two parts are fastened together by an eyelet?

"*Ans.* I did not.

"*Int.* 7. Did you contemplate in describing your invention as set forth in complainant's patent No. 325,-688, in the attachment of the fastener to the fabric, that the hole in the fabric should be limited to any particular size?

"*Ans.* I did not.

"*Int.* 8. Will you please state whether or not it is possible to always make the hole of the same relative size in attaching the fastener shown in complainant's patent No. 325,688 to the fabric, and give your reasons for any opinion you may express, or what your experience has been?

"*Ans.* The size of the hole would depend on the material to which it is fastened. On soft material with a small hole it would readily conform to the parts between which the material is held, while in thick or stiff material it would be necessary to make the hole materially larger, as the thick or stiff material would not stretch or conform to the two parts of the fastening."

In view of this testimony of the patentee, and the specification itself, the construction attempted to be placed by appellant upon the sixth and seventh claims of Mead patent is wholly unwarranted.

In practice it would be impossible in fasteners like the Schloss and Dowler English fasteners to so place the edges of the material that they would conform flatly to the flange at the base of the socket; the material would inevitably be clamped upward to a certain extent between these parts, that is, the socket and the dished washer.

Appellant asks: "When a man has built a structure which is entirely new and is useful, do you consider that that structure is that man's invention if he is not able to describe all the advantages which result from it?"

The trouble with the position of appellant is that the Mead structure is not new, and that that structure is shown substantially in the prior state of the art. If this is so, why should not prior inventors have the same benefit as Mr. Mead? And if they do have this benefit, then certainly their structures are capable of affording all the advantages which can be in any way derived from the Mead fastener.

It is admitted that there was nothing new at the date of the Mead patent, 325,688, in making a hole in a piece of fabric of just the size of the barrel of the attaching eyelet. If any construction is given to the claims of the Mead patent so that the socket therein spoken of is not a socket having a spring-flanged wings and co-operating with a button or stud, then the Mead invention would be fully anticipated by the prior contrivances.

In considering the position taken by the complainant in this case in regard to the novelty of the Mead structure, this inquiry is pertinent. Would the Mead buttonhole member be any less the Mead structure if a hole in the fabric was cut of such a size that the fabric did not extend up about the eyelet? Or would the Mead buttonhole member be any less the Mead structure if the eyelet which attaches the socket and cap was either larger or smaller?

You cannot apply the socket of the Mead device, on account of the peculiar shape of the socket, which is almost a sphere, unless the hole in the cloth is less than the diameter of the sphere. This necessarily, when the cap is very concave, presses the cloth to some extent against the cap; in other words, it is a necessary incident of attachment simply, and was never thought of by the inventor, or described, hinted at or claimed in his patent. It is absolutely no advantage, but objectionable, and the complainant has abandoned this sort of a cap, and uses one almost flat, where no squeezing or stretching can possibly take place.

See testimony of Mr. Livermore, page 93.

A claim so explicit cannot be enlarged by construction. (Keystone Bridge Co. *v.* Iron Co., 12 O. G. 980; 95 U. S. 274; Sutter *v.* Robson, 38 O. G. 230; 119 U. S. 530; Snow *v.* Railroad Co., 39 O. G. 1081; 121 U. S. 617; Bunching Co. *v.* Williams, 44 Fed. Rep. 190, 194.)

If the patent in suit can be sustained it must receive the narrowest construction. (Railway Co. *v.* Sayles, 15 O. G. 243; 97 U. S. 554, 556; Duff *v.* Sterling Pump Co., 23 O. G. 1622; 107 U. S. 636; Snow *v.* Lake Shore, etc., Railway Co., 39 O. G. 1081; 121 U. S. 617.) Not only in view of the prior state of the art, but by reason of the very terms of the specification, the appellant must be limited to the "precise improvement" described.

INFRINGEMENT OF MEAD PATENT 325,688.

We assert with great confidence that under any construction of the claims of the Mead patent (assuming, of course, that the claims are construed in accordance with the language used both in the claims and in the body of the specification) that the Kraetzer fastener does not infringe.

Appellant produced two expert witnesses, Mr. Brown and Mr. Quimby. These two men contradict each other on the question of infringement. Mr. Brown testified that the Kraetzer fastener infringed all the Richardson patents; Mr. Quimby, that it did not.

The sixth claim is: –

> "6. A member of a fastening device consisting of a hollow socket in combination with a rivet and button head, whereby it is centrally attached to the fabric, substantially as set forth."

Obviously the essential elements are a hollow cup-shaped socket, being the socket D of the drawings and specification, which is made in one piece with spheroidally yielding curved wings, a common rivet *l*, and an imperforate cap or button F.

To constitute an infringement of this sixth claim there must be the combination of the socket D and the imperforate cap or button F, united through the instrumentality of a rivet.

The socket D with spheroidally curved wings is not found in the Kraetzer fastener, neither is the imperforate cap or button head F, and appellant's expert says that there is no infringement of the fourth claim because there is no imperforate cap in the Kraetzer fastener. The cap and socket of the Kraetzer fastener are not united by an eyelet, but by an extension of the spring chamber.

The seventh claim is: —

> "7. A member of a fastening device composed of a hollow socket D, centrally attached by an eyelet *l*, the latter resting upon and within an annular depression *q*, formed in a concave collet or disk E, substantially for purposes herein set forth."

The essential elements are the hollow socket D, *above described*, the eyelet *l* and a concave collet or disk E having

an annular depression *q*. None of these elements are found in the Kraetzer fasteners.

Appellant's expert, Brown, who made out the *prima-facie* case, swore that the Kraetzer fastener infringed the fourth, sixth and seventh claims of the Mead patent; while Mr. Quimby says that there is no infringement of the fourth claim of Mead and that the sixth and seventh claims of Mead are only infringed when those claims are construed to mean that which is not even hinted at or suggested in the patent; and the conclusion to be drawn from his argument is, that if these claims are limited to a spring-flanged socket, the Kraetzer fastener does not even infringe the sixth and seventh claims, which, Mr. Quimby says, are infringed only when a certain interpretation is given them.

The absurdity of Mr. Quimby's argument on the question of infringement is most strikingly shown by his admission that there is no infringement of the fourth claim, and yet that there is an infringement of the sixth claim.

If there is no infringement of the fourth claim, as Mr. Quimby admits there is not, it is impossible to understand how there can be any infringement of the sixth claim. There is only one button head described and shown in the patent. This is called in several places "the imperforate cap or button head" F. This is made, as Mr. Quimby says, an essential element of the fourth claim, and as this element is not found in the Kraetzer fastener, Mr. Quimby says the Kraetzer fastener is not embodied in the fourth claim. An examination of the sixth claim shows that the "*button head*" is also made an essential element of that claim. Certainly there can be but one button head in this specification, and if it is clearly set up as an element of one claim, and for this reason that claim does not embody the Kraetzer fastener, then certainly any claim which as clearly contains this same element cannot embody the Kraetzer fastener.

Each of these sixth and seventh claims has as an element one piece socket having spheroidally curved wings.

As already stated, if either of these claims is to be construed so that any socket having a spring-sided opening to co-operate with a button or stud is meant, then the Mead alleged invention would be fully anticipated by nearly all the prior contrivances shown. In fact, to hold the Kraetzer fastener an infringement of the Mead patent is for the Court to hold that no one can use the Dowler fastener with a hole

in the fabric to which it is attached, of the size of the attaching eyelet, though this is shown in patents prior to Mead. If, however, these parts refer only to the socket and button head shown in the drawings and described in the specification of the Mead patent, then the most nearly corresponding parts of the Kraetzer fastener differ substantially from these parts, as a spring ring loosely contained in a chamber composed of two pieces of comparatively ductile sheet metal is a substantially different device from the Mead socket, consisting of a hollow shell of metal, having converging spring wings made as an integral part of that shell.

Mr. Livermore, speaking of the sixth claim of the Mead patent, says (page 69) that it

> "Refers to exactly the same elements as the fourth claim, except that it also includes the rivet or eyelet by which the socket and button head are fastened together, and the whole device attached to the fabric. If the rivet referred to in this claim is an independent rivet, or one made in a separate piece from the socket and button head that are connected by it, then it does not exist in the Kraetzer fastener, in which there is no rivet separate from the spring chamber, which, with its inclosing spring, corresponds most nearly to the Mead socket. . . . I am, therefore, of the opinion that any construction of the sixth claim of the Mead patent that would include the Kraetzer fastener would also include the Dowler fastener, and be anticipated thereby. And, further than this, that there is no one feature or collection of features in these parts of the Mead fastener, referred to in the sixth claim, that distinguish it from the fasteners of the Schloss, Bayer and Dowler English patents that exist in the Kraetzer fastener."

The seventh claim is limited to a hollow socket D, an eyelet *l*, and a disk E having a depression *q*. None of these elements are found in any of the alleged infringing Kraetzer fasteners. Mr. Livermore says: —

> "I am of the opinion, therefore, that unless the hollow socket D referred to in the seventh claim means the special form of socket shown and described in the Mead patent there is no feature of substantial novelty in the seventh claim, and said form of socket does not exist in the Kraetzer fastener. If the term 'eyelet', of the

seventh claim, means an ordinary eyelet independent of or a separate piece from the parts connected by it, then no such eyelet exists in the Kraetzer fastener. . . . I am, therefore, of the opinion that there is no feature of substantial novelty in the parts of the Mead fastener pointed out in the seventh claim that is embodied in the Kraetzer fastener, and that any construction of that claim that would include the Kraetzer fastener would also include the Dowler fastener and would be anticipated thereby." (See page 69.)

Mr. Quimby says that the resilient or socket member of the Mead fastener is a cup-shaped socket with spheroidally curved wings, and says that he does not find this in the Kraetzer fastener. (Page 128.)

"*Cross-Int* 26. Do you find, in your opinion, that the Kraetzer fastener embodies the new thing, namely, the cup-shaped socket with spheroidally curved wings?

"*Ans.* I do not."

The only novelty which Mr. Quimby finds in the Mead structure is that the spring-mouthed socket presses the glove leather upward into the button head and squeezes the leather against the inner surfaces of the button head.

It is to be observed that there is no proof anywhere in this record that any such thing takes place, when the Kraetzer fastener is attached. No proof has been offered by the complainant in any part of this record as to how the Kraetzer fastener is attached.

Appellant's expert, Mr. Livermore, says (page 94):—

"*Int.* 106. Is any such stretching of the fabric, such as you have referred to, necessary in the attachment of the Kraetzer fastener?

"*Ans.* It is not. The Kraetzer fastener may be effectually attached by having a hole in the fabric large enough to receive the whole dome cup portion of the socket, just as is shown in the Dowler patent. . . .

"These samples show clearly that the Dowler structure has all the capabilities, in relation to the stretching of the fabric, that the Kraetzer and Mead fasteners have, but the Dowler and Kraetzer fasteners have a capability beyond Mead's of permitting the leather over the back of the socket to be removed, so that the fastener can be applied without stretching the fabric."

It is perfectly obvious, on examination of the spring-containing chamber of the Kraetzer fastener, that the wide flange around its lower edge allows a hole in the material to be made of such a size that no squeezing or stretching of any kind is necessary, or is even possible. In this particular it is like the Dowler English fastener. Even if glove manufacturers, in attaching the Kraetzer fastener, squeezed and stretched the fabric, there is nothing in the Mead patent to give the owner of it any monopoly of this manner or process of attaching a fastener.

His Honor Judge Colt said (page 349) : —

> "The socket of Mead is composed of a cup-shaped washer with curved wings. It is applied to the interior of the glove flap, and it is secured to the exterior washer or button head by a central rivet passing through a hole in the glove flap. I do not understand that it is contended that either the cap or cup-shaped socket of Mead is new, or that an elastic mouth situated upon the under side of the flap and secured by a button head at the other side of the flap was not known in the art prior to the Mead patent. The invention of Mead, it seems to me, must be limited to his form of socket combined with an imperforate button head. The Kraetzer device does not contain the Mead socket and therefore does not infringe the Mead patent.
>
> "The complainant seeks to extend what appears to me to be the legitimate scope of the Mead patent, upon the theory that the spring-mouthed socket of Mead presses the leather upward into the button, and squeezes the leather against the inner surface of the button ; that this feature, in connection with the fact that the hole in the flap need not be any larger than the diameter of the rivet, introduces an important element of strength which is found, for the first time, in the Mead device. There are several reasons why this theory does not impress me with the importance with which it does the complainant : in the first place, I am not satisfied upon the evidence that there is any great advantage in pressing the fabric up into the button head ; in the second place, I think this feature was present in the prior Dowler English patent, although it is not exhibited in the drawings ; and, thirdly, Mead himself does

not seem to consider this feature of sufficient consequence to claim it as part of his invention. Before the Court should give such a broad construction to the Mead patent, as to include something not mentioned by the patentee as part of his invention, it should certainly clearly appear that the improvement was a substantial one, and that it is not found in any prior device. In this case, I do not think the complainant has made out the charge of infringement, and it follows that the bill should be dismissed.

"Bill dismissed."

There is no rule of law which allows to a patentee that which is not claimed in his patent, nor is there any rule of law which warrants a patentee in asking to have his claims construed to cover that which is neither shown nor described in his drawings or specification. The complainants in the case of the National Hat Pouncing Machine Co. *v.* Hidden, 36 F. R. 317, attempted this very thing; that is, the Taylor patent sued on in that case was anticipated by the patent of Eickemeyer's, and the counsel for complainant in endeavoring to save the Taylor patent argued that the Taylor machine, while like Eickemeyer's, had a new mode of operation; that is, that the Taylor patent, while its claims covered simply a machine, was really for a process, or new mode of operation.

Mr. Justice Bradley, in his opinion, says, speaking of the construction which counsel for complainant attempted to put upon the Taylor patent: —

"But there is no pretence of that kind in the patent itself, nor in the language of the claim. The claim is for a machine having a certain necessary mode of operation."

This decision of Mr. Justice Bradley was affirmed by this Honorable Court in 148 U. S. 482.

Judge Lacombe approved this well-established rule of law, in the case of Dickerson *v.* Parker, 38 F. R. 411. Speaking of the complainant's invention, he said: —

"It finds its patentability, if at all, solely in suggesting a useful combination of known parts, and should be strictly construed. The patentee must be confined to the express description which he has given, and the express claims which he has made; and any suggestion

of further combinations which might be latent in the one and not claimed in the other, is a dedication of that which is not claimed to the public."

Merrill *v.* Yoemans, 94 U. S. 568.
Bridge Co. *v.* Iron Co., 95 U. S. 274.
Miller *v.* Brass Co., 104 U. S. 350.
Water Meter Co. *v.* Desper, 101 U. S. 332.
Fay *v.* Cordesmann, 109 U. S. 420.
White *v.* Dunbar, 119 U. S. 47.
Weir *v.* Morden, 125 U. S. 98.

If the language of the specification and claim shows clearly what he desired to secure as a monopoly nothing can be held to be an infringement which does not fall within the terms which the patentee has himself chosen to express his invention.

McClain *v.* Ortmayer, 141 U. S. 425.

It is affirmed without any fear, that even if this same "squeezing and stretching" is applied to the Mead patent that there is no possibility, if the well-established rules of law are followed, of making it embody the defendant's fastener.

It is hardly necessary to cite to the Court the long line of Supreme Court decisions which have in recent years established beyond question the proposition that the patentee is bound by the language of his claims. The leading decisions to this effect are: —

Keystone Bridge Co. *v.* Phœnix Iron Co., 95 U. S. 274–278.
Burns *v.* Mayor, 100 U. S. 671, 672.
Railroad Co. *v.* Mellon, 104 U. S. 112–118.
Fay *v.* Cordesmann, 109 U. S. 408–420.
Turner & Seaman *v.* Davis Stamping Co., 111, U. S. 319–325.
Sargent *v.* Safe and Lock Co., 114 U. S. 63–85.
Shepherd *v.* Cargen, 116 U. S. 593–597.
Yale Lock Co. *v.* Sargent, 117 U. S. 373–378.
Yale Lock Co. *v.* Greenleaf, 117 U. S. 554–559.
White *v.* Dunbar, 119 U. S. 47, 51.
Crawford *v.* Heysinger, 123 U. S. 583, 606.
Dryfoos *v.* Weise, 124 U. S. 32–37.
Hender *v.* Miner Iron Works, 127 U. S. 370–375.

As His Honor Judge Atchison said, in Vincent *v.* Rigby, 64 O. G. 862: —

> "Upon the strict construction which, as we have seen, must be given to the patent in suit (if it be sustainable at all) no invasion of the plaintiff's exclusive rights is shown. (Railway Co. *v.* Sayles, *supra;* Hoff *v.* Iron Clad Mfg. Co., 40 O. G. 1244; 139 U. S. 326; Derby *v.* Thompson, 61 O. G. 1950; 146 U. S. 476, 482.) In the last cited case the Court said: —
>
> *But the fact that the defendants have been able by a skilful contrivance to dispense with one of the elements of the Kenna claim does not make the device an infringement.*
>
> "Poyton, at best, was a mere improver, structurally, of an old and commonly-used device. He applied no new principle. His claims are for combinations — all the constituents of which had previously been used in this art, and he produced no distinctively new result.
>
> "The defendant does not employ one of the specified elements — the cord *s*. The cases above cited show that the plaintiffs are not entitled to claim, broadly, the benefit of the doctrine of equivalents, which is rightly applicable to inventions of a primary character. Here the defendant does not make or use the specific form of device shown in the patent in suit, and therefore the plaintiffs have no just cause of complaint."

The claims of the Mead patent are specific, and element for element must be reproduced in the defendant's structure before it can be held to be within this patent, and consequently be an infringement thereof.

No construction can be given to the sixth and seventh claims of the Mead patent so as to make them embody the Kraetzer fastener that will not also make them include many other prior structures, as the appellee's fastener is much more nearly allied to many structures prior to the Mead than it is to the Mead, for, apart from the fact that they are both glove fasteners, they have no resemblance whatever to each other.

It is submitted that upon the facts and the law the decree of the Circuit Court should be affirmed.

W. B. H. DOWSE,
JOHN R. BENNETT,
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